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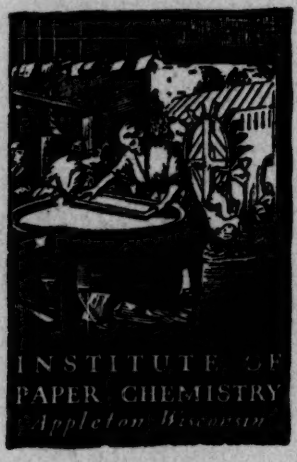

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APRIL · 1953

Volume 23 Number 8

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Books and Pamphlets Added to the Library During March

ATOMIC ENERGY

ANNUAL REVIEW of nuclear science. Published by Annual Reviews, Inc. in cooperation with the National Research Council of the National Academy of Sciences. Stanford, Calif., Annual Reviews, Inc., 1953. v. 2. 429 p.

BUSINESS CYCLES

BURNS, ARTHUR F., and MITCHELL, WESLEY C. Measuring business cycles. New York, National Bureau of Economic Research, 1947. 560 p.

CELLULOSE

HAYNES, WILLIAMS. Cellulose, the chemical that grows. Garden City, N.Y., Doubleday & Co., 1953. 386 p.

DISTILLATION

ROBINSON, CLARK SHOVE, and GILLILAND, EDWIN RICHARD. Elements of fractional distillation. 4th ed., rev. and rewritten by Edwin Richard Gilliland. New York, McGraw-Hill Book Co., 1950. 492 p.

DRYING

GREAT BRITAIN. *Department of Scientific and Industrial Research.* Bibliography of industrial drying. [London, H. M. Stationery Office] 1951. 3 v. 802 + 35 p.

DUST EXPLOSION

NATIONAL FIRE PROTECTION ASSOCIATION. National fire codes. Vol. II. The prevention of dust explosions. 1952 edition. Boston, The Association, 1952. 288 p.

HYDROGEN-ION CONCENTRATION

RICCI, JOHN E. Hydrogen ion concentration; new concepts in a systematic treatment. Princeton, N.J., Princeton University Press, 1952. 460 p.

PAPER—TESTING

FRANK, KARL, ed. Taschenbuch der Papierprüfung; Hilfs- und Nachschlagebuch für die Prüfung von Papier, Zellstoff und Holzschliff. Darmstadt, Eduard Roether Verlag [1952] 155 p.

PAPER MAKING AND TRADE—DICTIONARIES

LABARRE, E. J. Dictionary and encyclopaedia of paper and paper-making, with equivalents of the technical terms in French, German, Dutch, Italian, Spanish & Swedish. 2d ed., rev. and enl. Amsterdam, Swets & Zeitlinger, 1952. 488 p.

PHOTOSYNTHESIS

CALVIN, MELVIN. The path of carbon in photosynthesis. Reilly lectures. Volume II. Notre Dame, Ind., The University of Notre Dame, c1949. 54 p.

PLANTS—CHEMICAL ANALYSIS

RAWLINS, T. E., and TAKAHASHI, WILLIAM N. Technics of plant histochemistry and virology. Millbrae, Calif., The National Press [c1952] 125 p.

PULP

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. Tropical woods and agricultural residues as sources of pulp; papers presented at the fifth meeting of the FAO Technical Committee on Wood Chemistry, Appleton, Wisconsin, U.S.A., September, 1951. FAO forestry and forest products studies no. 3. Rome, Italy, The Organization, 1952. 190 p.

STATISTICAL METHODS

GORE, W. L. Statistical methods for chemical experimentation. New York, Interscience Publishers, 1952. 210 p.

STRENGTH OF MATERIALS

BLEICH, FRIEDRICH. Buckling strength of metal structures. With the collaboration of Lyle B. Ramsey ed. by Hans H. Bleich. New York, McGraw-Hill Book Co., 1952. 508 p.

Den HARTOG, J. P. Advanced strength of materials. New York, McGraw-Hill Book Co., 1952. 379 p.

NADAI, A. Theory of flow and fracture of solids. 2d ed. New York, McGraw-Hill Book Co., 1950. v. 1. 572 p.

TEXTILE INDUSTRY AND FABRICS

REVIEW of textile progress. Manchester, The Textile Institute, and Bradford, The Society of Dyers and Colourists [1952] v. 3, 1951. 590 p.

TRADE DIRECTORIES

The PAPER MAKERS' & merchants' directory of all nations, 1953. 60th ed. London, Business Publications Ltd., 1953. 628 p.

WATER

AMERICAN SOCIETY FOR TESTING MATERIALS. *Committee D-19 on Industrial Water.* Manual on industrial water. ASTM special

technical publication no. 148. Philadelphia, The Society [c1953] 336 p.

WOOD

STAMM, ALFRED J., and HARRIS, ELWIN E. Chemical processing of wood. New York, Chemical Publ. Co., 1953. 595 p.

WOOD—CHEMISTRY

ISTAS, J. R., and RAEKELBOOM, E. L. Contribution a l'étude chimique des bois du Mayumbe. Publications de l'Institut National pour l'Etude Agronomique du Congo Belge, série scientifique no. 53. [Bruxelles] The Institute, 1952. 122 p. + 5 fold. tables.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ABSORPTION SPECTRA

TREIBER, E. Absorption spectra of cellulose and its derivatives with particular reference to technical applications, especially in the viscose industry. Kolloid-Z. 130, no. 1: 39-63 (January, 1953). [In German]

Investigations of the absorption spectra of cellulose and cellulose derivatives with a detailed introduction on the general methods of obtaining and interpreting absorption curves for macromolecules are discussed. The paper is a review pointing out various applications of the methods to problems of the cellulose and related industries. These applications include the following: Absorption by cellulose of rays in the region greater than 3600-mm.$^{-1}$ frequency apparently arises from the chromophore -O-C-O- and is responsible for the photochemical scission of the β-glucosidal linkage. Investigations of the α-, β-, and γ-celluloses corroborate the recent views that γ-cellulose is quite dissimilar from cellulose with absorption maxima corresponding to uronic acids. β-cellulose may contain hydrolytically or oxidatively degraded cellulose, but it is also a heterogeneous material chemically. The absorption of cellulose esters is due primarily to the ester groups. It is obvious from the curves that true esters are formed. In particular, the xanthate is not present in the ortho-form. Rapid methods are mentioned for the analyses of xanthate solutions and of various waste liquors. 2 tables, 19 figures, and 76 references.

K.W.,Jr.

ACID RESISTANT MATERIAL

LINDH, E. GUNNAR. Stainless steel in the Swedish pulp industry; some experience with circulating systems for sulphite digesters, and with evaporators for black liquor in sulphate mills. Pulp Paper Mag. Can. 54, no. 3: 239-46, 252 (Convention, 1953).

In the beginning of the twenties the production of stainless steel started in Sweden, at first on 13% chromium steel and soon afterwards on 18/8- and 18/8 + Mo-steel. The paper-pulp industry in Sweden showed a great interest, and tests on different qualities were started about 1925. The sulfite mills successfully use 18/8-steel with an addition of 1.5% molybdenum, against 2.5% employed in many other countries. The type 27/5 + 1.5 molybdenum, corresponding to American Iron and Steel Institute (AISI) 329, is used to a great extent for the manufacture of seamless tubes as well as castings. These acid-resistant steels have made it possible to build circulating systems for indirect cooking of sulfite pulp. These Swedish systems are installed in about 550 digesters around the world. At first, difficulties appeared in some factories using brackish water for the manufacture of the cooking acid, because the chlorides in the acid caused pitting and stress-corrosion cracking. Such factories have changed, if possible, to fresh water, and the troubles have disappeared. The evaporators in sulfate mills consume important quantities of carbon-steel tubes, especially in the two first effects with thick black liquor,

where the erosion-corrosion attacks are heavy. In these effects tubes of 13% chromium steel have been installed in many Swedish and Finnish factories with great success. Canadian mills often use 18/8-steel for the evaporator tubes. 2 tables, 13 figures, and 6 references. E.S.

ADHESIVES

BAUER, JORDAN V. One-bag, alkaline water-resistant adhesive. Fibre Containers 38, no. 2: 48, 53 (February, 1953); *cf.* B.I.P.C. 22: 477.

A new corrugating adhesive product, Hubco 515-X WR, is claimed to be a considerable improvement over the original alkaline water-resistant paste previously described. Only water and a small amount of borax have to be added to the dry-paste product; the time of preparation of a batch is about 35 to 40 minutes. The moisture content of the paperboard liners was found to have a marked effect on the water resistance of the finished weatherproof board; paperboard components of low moisture content give much better results. Three formulas are included. E.S.

FOULON, A. Preservation of glues and adhesives. Wochbl. Papierfabr. 80, no. 22: 814 (Nov. 30, 1952). [In German] *cf.* B.I.P.C. 9: 331.

The advantages of Raschit (*p*-chloro-*m*-cresol), particularly Raschit K, as a preservative for adhesives are emphasized. E.S.

AIR CONDITIONING

KING, CHARLES F. Air conditioning problems in lithographic plants. Inland Printer 130, no. 6: 48-9, 52-3, 85 (March, 1953).

The author emphasizes the fact that lithographic plants (I) require a special type of air conditioning with a great number of problems peculiar to this industry. The present systems in (I) are usually a conversion of some prefabricated comfort-conditioning job for a purpose for which it was never intended. When the expected results are not forthcoming, the disappointed purchaser is liable to consider air conditioning useless. A thorough study of these problems by competent engineers familiar with the industry and the construction of an efficient system specially designed for (I) are recommended. Pressrooms should not be conditioned at 50%—as frequently recommended, but rather at 45% R.H. because paper, which should be in condition with a higher humidity than the pressroom, is seldom up to 50% when delivered from the mill. It would have to be seasoned to bring it to the proper moisture content, requiring additional space, conditioner capacity, and expense. E.S.

ALKALINE PROCESSES—ODOR TROUBLE

BERGSTRÖM, HILDING. Pollution of water and air by sulfate mills. Svensk Papperstidn. 56, no. 3: 75-80 (Feb. 15, 1953). [In Swedish; English summary]

The author reviews the air- and water-polluting substances released during the different stages of the sulfate process, the locations where they are discharged, and methods for eliminating or rendering them harmless. 2 tables, 6 figures, and 3 footnotes. E.S.

ALKALINE PROCESSES—RECOVERY

ALLAN, J. A review of the operation of the Tomlinson secondary recovery system. Pulp Paper Mag. Can. 54, no. 3: 202-4 (Convention, 1953).

The Tomlinson secondary recovery system was installed at the Canada Paper Company to recover the chemical and heat from the effluent gases from a new 175-ton B&W Tomlinson furnace. The decision to install this unit in preference to others designed for similar purposes was made as a result of tests which indicated that relatively high heat and chemical recovery could be expected for a low capital expenditure. The original installation consisted of a dust-collection tank, a cyclonic evaporator, two deluge towers in series, a cyclone, an induced draft fan, and one wooden condenser. Later it has been found necessary to erect another wooden condenser and a 300-ft. concrete stack. Data, obtained during the past few years, have shown that approximately 100 lb. of sodium salts are recovered for each airdry ton of pulp produced and in addition to this, a heat recovery of 4×10^6 B.t.u. per airdry ton is obtained. Although there have been numerous repairs made on this installation, it is felt that these have been reasonable in view of the financial return obtained during the period of operation and the fact that many of the repairs probably would not have been required if adequate experience in the operation of such equipment could have been obtained prior to the original start-up. 1 diagram. E.S.

ASSOCIATIONS

AMERICAN PAPER AND PULP ASSOCIATION. 1952 reports of the working committees of A.P.P.A. Paper Trade J. 136, no. 8: 69-71, 108 (Feb. 20, 1953); Southern Pulp Paper Manuf. 16, no. 4: 54-62 (April, 1953).

Summaries of the reports of the following working committees concerned with over-all industry problems are presented: Forest Policy Committee, Community Relations, Traffic Committee, Industrial Relations Committee, Public Affairs Committee, Forest Industries Council, Materials Committee, Export Committee, Controllers Committee, Statistical Committee, and Committee on Coordination of Research. E.S.

JONES, DOUGLAS. A short review of Technical Section activities and services to the industry. Pulp Paper Mag. Can. 54, no. 3: 154-6 (Convention, 1953); Tappi 36, no. 3: 125-7A (March, 1953); *cf.* B.I.P.C. 22: 559-60.

The report of the Executive Secretary of the Technical Section of the Canadian Pulp and Paper Association for 1952 is presented. The history of the development of the Technical Section since its inception in 1915 is traced with particular reference to its contributions to better forest management and technological advances, its organization of 10 district branches and 17 special committees, its liaison with the Research Institute, and its publications. Membership, finance, and staff change reports are appended in the first reference. L.C.

MACDONALD, R. G. Report of the Secretary. Tappi 36, no. 3: 73-4A, 76A, 78A, 80A, 82A (March, 1953); Paper Mill News 76, no. 8: 114, 116-18, 188 (Feb. 21, 1953); *cf.* B.I.P.C. 22: 560.

The text of the annual report of the Technical Association of the Pulp and Paper Industry for 1952 is presented, covering membership, necrology, meetings and conferences, publications, the TAPPI Fibrary, employment, research projects, local sections, and divisions and committees. E.S.

PARSONS, JOHN L. Research Appropriations Committee report—1952. Tappi 36, no. 3: 92A, 94A, 96A (March, 1953).

A list of the new 1952 research grants (a total of 11) and a summary of the annual progress reports of the active projects are presented. 1 table. E.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Condensations of annual meeting papers. Tappi 36, no. 3: 42A, 44A, 46A, 48A, 50A, 52A, 56A, 58A, 60A, 62A (March, 1953); Paper Mill News 76, no. 8: 58, 154, 156, 158, 160, 162, 164, 166, 170, 172 (Feb. 21, 1953); Paper Trade J. 136, no. 8: 96, 98, 100, 102-4, 106 (Feb. 20, 1953); Southern Pulp Paper Manuf. 16, no. 3: 72-4, 76, 111 (March, 1953); *cf.* B.I.P.C. 22: 560.

Condensations of a number of papers presented at the 38th annual meeting of TAPPI in New York, February 16-19, 1953 are given. E.S.

BAGASSE

PERILÄ, OLAVI. Fine paper pulp from bagasse. Paper and Timber (Finland) 35, no. 2: 29-34 (February, 1953). [In Finnish; English summary]

The principal purpose of this study was the determination of the minimum amount of chemicals required to produce easy-bleaching pulps from bagasse with different cooking procedures and the comparison of the pulps obtained by these methods. These included the sulfate, Pomilio, Gruco, combined water prehydrolysis-sulfate, sodium sulfite, sodium bisulfite, and combined sodium bisulfite-sulfite processes; of these, the sulfate, Pomilio, and sodium sulfite processes were found the most suitable. The amounts of chemicals required in the three processes for both bleached and unbleached pulps are given in tabular form, including pulp yields, and physical strength data for the resulting pulps (breaking length × tearing area and bursting area × tearing area). With regard to strength, the bagasse sulfate pulps were found to come closest to easy-bleaching spruce sulfite pulps, the Pomilio pulps to strong spruce sulfite pulps, and the sodium sulfite pulps to bleached spruce sulfite pulps. 11 tables, 2 figures, and 14 references. E.S.

BIOLOGICAL TESTING

HAYDU, E. P., AMBERG, H. R., and DIMICK, R. E. The lethality of methyl mercaptan to king salmon as influenced by variation of the volume of test solution. Tappi 36, no. 3: 131-3 (March, 1953).

Preliminary bioassays showed that differences in the volume of methyl mercaptan produced varied effects on the test fish. Using king salmon, bioassays conducted in solutions of methyl mercaptan of varying concentrations and volumes showed that increases in the volume of the test solution resulted in the subsequent decrease in the concentration of mercaptan necessary to effect 100% mortality. 3 tables, 4 figures, and 2 references. E.S.

BIRCH

JENSEN, WALDEMAR, and JORRI, HEIKKI. Birch as raw material in pulp manufacture. V. The strength properties of birch and spruce sulfite mixtures. Paper and Timber (Finland) 35, no. 2: 35-7 (February, 1953). [In Swedish; English summary] *cf.* B.I.P.C. 22: 650-1.

The strength properties of mixtures of birch (*Betula verrucosa*) and spruce (*Picea excelsa*) sulfite pulps have been studied. The results are presented in tabular and graphical form (with English headings). An addition of 10-20% of birch pulp to spruce sulfite was found to cause a slight improvement in breaking length and tear, whereas the influence of birch pulp on folding endurance is unfavorable. However, the addition of 10% or even more of birch pulp will not cause an actual lowering of the resulting pulp quality. 1 table, 12 diagrams, and 4 references. E.S.

BOARD

ANON. No additives used in process for making hardboard from sawmill waste. Chem. Processing 16, no. 3: 67-9 (March, 1953); *cf.* B.I.P.C. 22: 895-6.

A brief description of the process for making hardboard known as Allboard is given. 2 illustrations. E.S.

GATES, JAMES E. Paperboard unlimited—an economic evaluation. Fibre Containers 38, no. 2: 34, 38, 43-4, 46 (February, 1953).

Forecasts for population and per-capita-consumption-of-paperboard increases for the period up to the year 2000 are discussed, including low, medium, and high forecasts. Even if the most pessimistic outlook is adopted, the growth of the boxboard industry in the future promises to be a repetition of the pattern of the past. The increased demand for fibers and the tightening supply of pulpwood will probably mean a resurgence of the jute facilities in the cylinder-machine mills. 4 tables and 3 charts. E.S.

NEBEL, FRITZ. The manufacture of handmade board: uniform basis weight and thickness. Wochbl. Papierfabr. 80, no. 23: 859-64 (Dec. 15, 1952). [In German]

So-called handmade board is prepared on wet machines, and several layers are couched together to form thicknesses which can no longer be handled by either cylinder or Fourdrinier machines; they are used for special purposes. One of the problems in their manufacture is uniformity of basis weight and thickness; useful hints for stock preparation, the handling upon the board machine, and during pressing and calendering are given to improve these conditions. Several examples and calculations are included. E.S.

SIDES, ROY H., and COLUCCI, JOHN, JR. The European chipcore industry. J. Forest Products Research Soc. 3, no. 1: 19-20, 78 (February, 1953).

The authors present a survey of the European dry-formed, particle-board industry, with particular reference to Swedish and German practices. They found little apparent difference from American methods in material preparations and formulas. The development and use of particle board has been accelerated by the higher cost of lumber in Europe, and a wide market for such products has been developed. All these products could be duplicated with American-manufactured equipment; however, European procedures and products are not always suitable for American conditions. In the authors' opinion, the splinter-type board has a much wider potential as a replacement for lumber core; American plants and processes can produce such material more economically than the European counterparts. E.S.

BOARD—DEFECTS

R. F. The warping of boards. Allgem. Papier-Rundschau no. 2: 50-1 (Jan. 26, 1953). [In German]

Directions for the correct treatment and handling of boards during manu-

facture and storage are given to prevent the tendency for warping. The correct beating of the furnish during stock preparation is far more important than the selection of the individual components, including sizing agents and fillers. Uniform stock flow, dewatering, pressing, drying, and calendering play an important role. However, the best, perfectly flat board can be ruined by improper storage conditions (moist cellars, placing directly on the floor, constantly varying temperature and humidity conditions, etc.). E.S.

BOARD MILLS

ANON. An Alsatian board mill—Kaysersberg. Papier, carton et cellulose 1, no. 3: 34-6 (July-August, 1952). [In French]

An illustrated description of the board mill in Kaysersberg, Alsace with an annual output of 22,000 metric tons is given; steamed groundwood and waste paper are the principal raw materials. 12 figures. E.S.

BOARD SPECIALTIES

ANON. The manufacture of large s.r.b.p. tubes for the electrical industry. Brit. Plastics 26, no. 285: 44-7 (February, 1953).

The manufacture of large resin-bonded paper tubes in the plant of Ferranti Limited, Hollinwood, Lancashire from high-grade electrical sulfate paper impregnated with cresol-formaldehyde and wound upon mandrels to the required thickness is described. A new large tube-winding machine will wind a cylinder 9 ft. in diameter and 12 ft. in length, although the majority of the tubes do not reach quite this size. They are in great demand for heavy electrical equipment, particularly for transformers and guide sleeves for connecting wires and cables. Smaller cylinders are used as reels and bobbins in the textile industry. 11 illustrations. E.S.

BOARD TESTING—PHYSICAL

ATTWOOD, B. W. Examination of paperboard formation by beta radiography. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 33, no. 3: 659-66 (December, 1952).

The property of paper and boxboard known as formation is defined as the pattern and extent of the small-scale variation of basis weight from place to place. The difficulty of examining the formation of boxboard owing to its opacity is explained, and a method of using beta radiography is described which overcomes this difficulty. Details are given of the preparation of a beta-ray emitter plate 6 inches square, which gives a very even emission over its whole surface. Examples of radiographs of boxboard are shown. Experimental work is described which indicates that the electron-stopping power of a sheet material is dependent on its atomic constitution, as well as on its basis weight. The effect is most marked with elements of high atomic number and is not a serious source of error with paper and board of normal constitution. 1 table, 5 figures, and 4 references. E.S.

KNAPPE, J. C. Some studies on the water vapor permeability of board. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 33, no. 3: 567-73 (December, 1952); World's Paper Trade Rev. 138, no. 25: 1912, 1914 (Dec. 18, 1952). [Abridgment]

The details of two series of tests are described, in which the effects of temperature and relative humidity on the water-vapor permeability (I) of hardboard were studied. The results showed that increases in temperature cause much greater increases in (I) than are caused by relative humidity. A change in R.H. from 65 to 90% at 68°F. caused a change in (I) of 25 units, whereas an increase in temperature from 70 to 100° resulted in a change of 120 units. 2 tables and 4 figures. E.S.

VAN DEN AKKER, J. A., HARDACKER, K. W., and JONES, E. J. A preliminary investigation of the adaptability of the General Electric puncture tester to the testing of structural insulation board. Tappi 36, no. 3: 111-23 (March, 1953).

The General Electric puncture tester (I) (*cf.* B.I.P.C. 17: 37) has been investigated as a possible means for testing the puncture resistance of insulation board. It has been provided with a special specimen holder which supports a specimen in a manner partially simulating the span involved in the typical use of insulation board; in order that the testing of $^{25}/_{32}$-inch sheathing might be encompassed, the scope of (I) has been extended to a new "Range 5." A detailed analysis of the energy effects in the puncture of insulation board by means of (I) equipped with the special specimen holder is presented. In the testing of 40 specimens of $^{25}/_{32}$-inch sheathing made by different manufacturers it was observed that (I) operating on the new Range 5 successfully punctured 38 and almost completely punctured the remaining two specimens; this would suggest that the new range could be appreciably augmented. The arm of (I) was equipped with an electric strain gage which, together with other electric and electronic equipment, permitted the presentation of the force-distance relationship during actual puncturing of the board on the screen of an oscilloscope. The traces for the puncturing of a large number of specimens of various types of insulation board were photographed, and the photographs were translated to force *vs.* distance charts for analytical purposes. The results of the analyses of these charts are given. Microflash pictures, taken from below and above the specimens at different stages of flexing and puncturing were obtained for studying the kinds of failure of different types of insulation board. Data were also obtained on the degree of flexure of the puncture arm of (I). The significance of puncture data with regard to the use of insulation board was not studied in the present investigation. 3 tables, 18 figures, and 5 references. E.S.

BONDED FIBER WEBS

CAMPBELL, JEROME. Nonwoven fabrics. Modern Textiles 34, no. 2: 31, 67, 69-70 (February, 1953).

The method of manufacture, the physical characteristics of some products, different applications, and future trends of nonwoven fabrics are discussed. The increasing end uses are mostly on the utility level. E.S.

CALCULATIONS

GUT, H. The correct projection for cones and frustums. Allgem. Papier-Rundschau no. 2: 54-5 (Jan. 26, 1953). [In German]

Calculations for determining the area of blanks required for cone- or frustum-shaped articles are presented. 10 diagrams. E.S.

GUT, H. Should the useful capacity and dimensions of cardboard boxes be determined by empirical means or by calculation? Allgem. Papier-Rundschau no. 5: 203-5 (March 5, 1953). [In German]

Examples of calculations are given for determining the required volume of containers for pulverized or small-grained materials (detergents, chemicals, etc.) which are not bound to definite dimensions. The boxmaker is frequently asked to develop a container for a certain net weight; he is hardly ever familiar with the composition and unit weight of the goods. Formulas are presented for determining the required container size under this condition. 3 figures. E.S.

CASEIN

WILSON, H. Casein summary 1952. Paper Trade J. 136, no. 8: 156-8 (Feb. 20, 1953); *cf.* B.I.P.C. 22: 482.

Domestic casein production during 1952 was at an all-time low; Argentina had accumulated a casein inventory estimated at some 20,000 metric tons. There was little consumer demand and the price went steadily downward. During the year Argentina recovered its place as the principal casein supplier to the United States market while carrying the very large inventory accumulated the previous year. A substantially higher price in the near future is improbable, as long as casein stocks continue at their present high level. Little domestic casein will be available during 1953; however, there will be a plentiful supply of foreign casein at or near present prices until Argentina's large inventory has been reduced to its customary level of 10,000 tons either through increased exports or curtailment of production. 3 tables. E.S.

CELLULOSE

LANG, HANS. The degree of polymerization and the uniformity of wood celluloses. Das Papier 7, no. 3/4: 52-6 (February, 1953). [In German; English and French summaries]

The terms D.P. and uniformity are defined and shown to be based on the distribution curve of the D.P.'s (I). Examples are given which indicate the relationship of (I) and certain properties of wood celluloses, such as osmotic pressure, viscosity, sedimentation, diffusion, and mechanical properties. The author refutes the statement that polydispersity signifies a deterioration of the cellulose properties under all conditions. The relationships can be readily determined for films prepared from cellulose derivatives; they are much more difficult to find for threads, and still more complicated for native fibers. In the last-mentioned case it is certain that the morphological structure has a greater influence than the D.P. and that the arrangement of the molecules plays a more significant role than their magnitude. 1 table, 6 figures, and 8 references. E.S.

MEREDITH, R. Cotton and cellulose—physics. Rev. Textile Progress 3: 7-18 (1951); *cf.* B.I.P.C. 22: 565.

Investigations into the structure and physical properties of cotton and native cellulose, by means of x-rays and the electron and optical microscopes, as applied in recent years, are reviewed. 46 references. R.G.K.

NEVELL, T. P. Cotton and cellulose—chemistry. Rev. Textile Progress 3: 19-43 (1951); *cf.* B.I.P.C. 22: 565.

The author reviews the year's progress made in the field of cellulose chemistry under the headings: the structure of cellulose and its derivatives, the action of alkaline solutions on cellulose, preparation and properties of cellulose derivatives, and preparation and properties of chemically modified celluloses. 119 references. R.G.K.

STAUDINGER, HERMANN, IN DEN BIRKEN, KARL-HEINZ, and STAUDINGER, MAGDA. Macromolecular compounds. [373] Cellulose. [107] The micellar or macromolecular structure for cellulose. Makromol. Chem. 9, no. 2: 148-87 (February, 1953). [In German; French summary] *cf.* B.I.P.C. 23: 88-9.

The authors present their reasons for advocating a macromolecular and not a micellar structure for cellulose. This paper is an extension with more de-

tail of the previous presentation. The acetylation of various types of cellulose has been followed for cotton, ramie, flax, and hemp on dry fiber, dry mercerized fiber, and fiber swollen with organic liquids by solvent exchange (inclusion fibers). The swollen fibers are much more reactive than the others, and the dried mercerized fibers are the least reactive. Acetylation with pyridine and acetic anhydride proceeds homogeneously, as chloroform does not dissolve out any triacetate. On the other hand, chloroform dissolves out triacetate from acetates prepared with benzene, acetic anhydrides, and sulfuric acid. Much more is dissolved from the acetylated swollen fibers, and the undissolved residue is very low in acetyl. This indicates localized action in this case, as compared with homogeneous reaction in other types of acetylation. 26 tables, 25 figures, and 59 footnotes. K.W.,Jr.

CELLULOSE—REACTIVITY

STAUDINGER, HERMANN, and DÖHLE, WOLFGANG. Macromolecular compounds. [374] Cellulose. [108] Acetylation of inclusion celluloses. Makromol. Chem. 9, no. 2: 188-9 (February, 1953). [In German; French summary]

The authors interpret the kinetics of acetylation of cyclohexane-included mercerized cellulose by pyridine and acetic anhydride as an indication of rapid acetylation of the primary hydroxyl groups, slow acetylation of one of the secondary groups, and very gradual acetylation of the last group. 1 table, 1 diagram, and 4 footnotes. K.W.,Jr.

STAUDINGER, HERMANN, and DÖHLE, WOLFGANG. Macromolecular compounds. [375] Cellulose. [109] Transformation of native to mercerized cellulose. Makromol. Chem. 9, no. 2: 190-2 (February, 1953). [In German; French summary]

Dry mercerized cotton fiber does not acetylate as readily as the native fiber. If cyclohexane is included, however, it acetylates more readily. On nitration, mercerized fiber is degraded with a sulfuric acid, but not with a phosphoric acid catalyst. Native cellulose is not degraded appreciably if care is taken with either catalyst. Using these criteria, the effect of treating cotton with sodium hydroxide of concentrations varying from 2.5 to 40% was determined. In the nitration studies, alkali treatment was carried out at 0 and 50°C. and the degree of mercerization followed by the nitration number, i.e., the ratio of the D.P. of the sulfuric acid nitrate to the phosphoric acid nitrate. 3 tables and 3 footnotes. K.W.,Jr.

CELLULOSE ETHERS

HAAS, HOWARD C., FARNEY, LEONARD C., and VALLE, CLAUDE, JR. Mixed ethylcellulose-butylhydroxyethylcellulose films. Ind. Eng. Chem. 45, no. 3: 564-6 (March, 1953).

During an investigation of ethers of hydroxyethylcellulose, it was observed that several of these are compatible with ethylcellulose; a butyl ether containing 1.5 combined ethylene oxide and 2.0 to 2.1 butyl groups per anhydroglucose unit, in particular, was found to be compatible with ethylcellulose in all proportions. A study of blends of these two materials was made. Perfectly clear mixed films of these two polymers are obtained by casting from a mutual solvent—in this case, benzene. Stress-elongation measurements on these films show a smooth transition in properties from pure ethylcellulose to pure butylhydroxyethylcellulose. Film properties appear to be simple functions of film composition; the yield stress, tensile strength, and softening point decrease in a linear fashion with butylhydroxyethylcellulose

content. A plot of brittle temperature *vs.* film composition has a maximum. As the butyl ether is a relatively low-modulus material of high extensibility, the blending of this polymer with ethylcellulose permits the modification of the mechanical properties of the latter to a considerable extent. For certain applications, butylhydroxyethylcellulose may be used as a polymeric plasticizer for ethylcellulose. 1 table, 4 figures, and 11 references. E.S.

CHEMICAL ENGINEERING—ESTIMATES AND COSTS

CHEMICAL ENGINEERING. Process equipment costs are becoming stabilized. Chem. Eng. 60, no. 3: 220-1 (March, 1953); *cf.* B.I.P.C. 22: 484.

The Marshall and Stevens annual average indexes of comparative equipment costs for eight process industries, including the pulp and paper industry, and four related industries are presented. The data cover the period 1913-1952. With 1926 taken as 100, the 1952 index for pulp and paper amounts to 174.7, as compared with 174.3 in 1951. All components of the index held quite constant throughout 1952. 2 tables and 10 diagrams. E.S.

CHEMICAL TESTING—PULP—ALPHA CELLULOSE

MONZIE, P. Determination of "noble cellulose." Assoc. tech. ind. papetière, Bull. 6, no. 4: 163-6 (October, 1952). [In French]

The author prefers to use the term "noble cellulose" to the more usual term α-cellulose, which he reserves for cotton cellulose insoluble in 17.5% alkali. Hand-shredded pulp (5 g.) stirred in 200 ml. of water was subsequently treated with 1.7 g. of sodium chlorite in 300 ml. of water and sufficient acetic acid was gradually added so as to maintain a pH of 4.9-5.0 (determined by a glass electrode). The suspension was heated 20 minutes at 70-75°C., cooled, filtered through a weighed 2G2 fritted glass crucible (I), and washed thoroughly with water and acetone. The bleached air-dried pulp was then subjected to the usual α-cellulose determination, the fibrous residue being filtered on (I). L.E.W.

CHEMICAL TESTING—PULP—COPPER NUMBER

BENARD, M. Application of the Schwalbe-Braidy copper-number method to wood pulps. Assoc. tech. ind. papetière, Bull. 6, no. 4: 162-3; discussion: 163 (October, 1952). [In French]

The author found that the copper number dropped markedly with increasing disintegration of the pulp; e.g., 25-sq. mm. pulp samples (I) gave far higher copper numbers than did thin layers (II) removed from the sample with a razor and then disintegrated with needles used in microscopic work. Intermediate between the copper numbers of (I) and (II) were the copper numbers of pulp samples 5 by 1 sq. mm., 1 sq. mm., and coarsely scraped pulp samples. Similar results were not obtained with cotton linters, which give higher copper numbers, the greater the disintegration. These results indicate the need for specifying the method of disintegration in copper-number determinations. 2 tables. L.E.W.

CHEMICAL TESTING—PULP—LIGNIN VALUE

TROUT, P. E., FRANCKOWIAK, P. A., HAM, J. L., BROWNING, B. L., and BUBLITZ, L. O. Routine determination of lignin in semichemical pulps by a modified Tingle procedure. Tappi 36, no. 3: 123-6 (March, 1953).

Direct methods of lignin determination are too time-consuming to be practical for mill-control use. For this reason, most routine hardness or bleachability tests employ indirect methods. The most widely used of these, the permanganate number, was shown to be inapplicable to semichemical pulps. Inability of the permanganate to penetrate the fiber bundles and shives in the pulp resulted in permanganate numbers that could not be correlated with the lignin content of the pulp. It was found that treatment of the pulp sample with a 9:1 mixture of hydrochloric and sulfuric acids (as employed in the Tingle bromine absorption method) swelled and partially dissolved the cellulose, thus rendering the lignin more accessible. Subsequent addition of hypochlorite afforded a chlorine bleachability test which rivaled the permanganate method in speed and simplicity. Good linear correlation between TAPPI lignin content and chlorine consumed was obtained for neutral sulfite semichemical aspen pulps having lignin contents ranging from 12 to 17%. 1 table, 3 figures, and 4 references. E.S.

CHEMICAL TESTING—ROSIN

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Analysis of rosin size. Tappi 36, no. 3: 142-6A (March, 1953); *cf.* B.I.P.C. 14: 165.

A revision of TAPPI Tentative Standard T 628 m-43 is presented. 1 reference. E.S.

CHEMICAL TESTING—SULFITE WASTE LIQUOR

AHLÉN, LARS, and SAMUELSON, OLOF. Determination of methanol and ethanol in spent sulfite liquor and condensate of spent sulfite liquor. Svensk Papperstidn. 56, no. 3: 81-4 (Feb. 15, 1953). [In Swedish; English and German summaries]

The accuracy of the pycnometric determination of alcohol in spent sulfite liquor and condensates from spent sulfite liquor according to the Swedish standard method CCA12 (*cf.* B.I.P.C. 15: 367-8) has been investigated. The carbonyl compounds present in the distillate are shown to have only a negligible influence upon the results. Different factors which affect the determination of methyl alcohol by the chromotropic acid method have been studied. Interfering formaldehyde can be removed by means of ion exchange. However, the formaldehyde concentration in the distillates obtained according to CCA12 is usually so low that the removal of formaldehyde is not essential. 9 tables, 1 figure, and 16 references. E.S.

KLEINERT, THEODOR, and WINCOR, WILHELM. The determination of spent sulfite liquor in water. Das Papier 6, no. 23/24: 513-19 (December, 1952). [In German]

Methods which might be applicable to the detection and estimation of spent sulfite liquor in river waters were reviewed, and the so-called tyrosine reaction of Berk and Schroeder (*cf.* Ind. Eng. Chem., Anal. Ed. 14: 456-9 [1942]) was re-examined and found to be especially suitable. With minor modifications of this method, the total organic matter of both hardwood (beech) and softwood (spruce) spent sulfite liquors could be estimated reliably in dilutions up to about 1: 50,000 using visual photoelectric colorimeters. Sugar (glucose) and free sulfur dioxide do not influence the sensitivity of the test. Hydrogen sulfide may interfere, if present, but can easily be removed by weak acidification with phosphoric acid and brief heating before use of the tyrosine reagent. For the direct determination of lignin, the direct bromination of lignosulfonic acid was studied further, and the

bromine consumption for both beech- and sprucewood lignin substances were found to be about similar at a level of approximately eight atoms of bromine for each phenylpropane group. 2 tables, 4 diagrams, and 29 footnotes.
A.J.W.

CHEMICALS

WALSH, JOHN M. Paper chemicals; views and reviews. Paper Trade J. 136, no. 8: 153-4 (Feb. 20, 1953).

Brief reviews on the trends in availability and prices of rosin size, alum, synthetic resins used in the industry, casein, and specialty chemicals (improved rosin and wax sizes and emulsions) during 1952 are presented. E.S.

CHLORINE

CHEMICAL ENGINEERING. Chlorine shortage is over. Chem. Eng. 60, no. 3: 192-3 (March, 1953).

The markets failed to expand sufficiently in 1952 to use up the new chlorine capacity which has been installed. Although the prospects are better for 1953, the phenomenal growth trend of the past 20 years (12% per year) cannot continue forever. There is no oversupply of caustic at present; however, the industry is not being lulled into a false sense of security. New markets are being developed and the gradual shutdown of lime-soda plants will help to take up the oversupply of electrolytic caustic for the next few years. Developments in new cells are mentioned briefly. 1 illustration. E.S.

GARDINER, WILLIAM C. Electrolytic caustic and chlorine industries. J. Chem. Education 30, no. 3: 116-20 (March, 1953).

The electrolytic alkali-chlorine industry is undergoing a 50% expansion in 36 new plants. More than half of the new production will be with diaphragm cells; the latest Hooker cell is described. Mercury cells have increased in popularity because concentrated caustic soda of rayon quality is produced directly at the cells. Following a brief general introduction on the mercury-cell process, the latest type E-8 Mathieson cell is outlined. 6 figures. E.S.

CLAY

ALTON, T. W., and SCHIERHOLTZ, O. J. China clay in aqueous suspension; effect of anions on flow properties. Pulp Paper Mag. Can. 54, no. 2: 67-72 (February, 1953); *cf.* B.I.P.C. 21: 100.

In the present study, commercial china clay (English china clay used in the paper-coating industry) was converted to a potassium clay by treatment with either potassium sulfate (I), potassium chloride (II), potassium phosphate (III), or potassium acetate (IV). Prior to the salt treatments, calcium carbonate was removed with sodium bisulfite; the treatments were found to be most effective at pH 6, so that this condition was maintained throughout. Water was used as the suspending liquid and 0.05% Calgon (on the weight of the dry clay) was added as a dispersing agent. The rheological properties of the treated clay suspensions in the range of 50-60% solids were determined by plotting the shear rate against increasing torque as abscissa and the results were compared directly with the flow properties of an untreated clay. The individual curves obtained for each salt are discussed in detail; they indicate that (III) had the greatest tendency to increase fluidity, with (II) a close second. The effects of (I) and (IV) were very much weaker. The (IV)-treated sample behaved somewhat differently from the others; the acetate ion seems to interfere with the action of Calgon on the clay particle (i.e., it completely nullified its action as a dispersing agent) and, when washed

with distilled water, the suspension stiffened markedly. The experimental results of this paper seem to emphasize the observation of certain previous investigators, namely, that a mixture is not a thixotropic, dilatant, or Newtonian mixture, but is rather capable of exhibiting any one of these characteristics when in motion within a limited range of shear rates. In many practical investigations, the problem is to determine the shear-rate range within which a particular mixture will exhibit the desired rheological behavior, or to determine what changes in composition are necessary to make it fall within the required range. 3 tables, 8 figures, and 8 references. E.S.

COLORIMETRY

NICKERSON, DOROTHY, TOMASZEWSKI, JOSEPHINE J., and BOYD, THOMAS F. Colorimetric specifications of Munsell repaints. J. Opt. Soc. Amer. 43, no. 3: 163-71 (March, 1953).

A table of I.C.I. tristimulus values and chromaticity co-ordinates and Munsell renotations is provided for repaints of all regular Munsell standard papers made up to July, 1950, that have not been reported previously. The colorimetric data were calculated from spectrophotometric measurements. 1 table and 4 references. E.S.

RUDICK, LAWRENCE, and INGLE, GEORGE W. Color control by use of small color differences. Instruments 26, no. 3: 400-1, 432-4 (March, 1953).

The authors describe a method of color-tolerance specification in which the I.C.I. co-ordinates of the specimens are obtained through the use of the "color eye." Tolerances for each standard specimen are based on "limit" specimens showing the maximum color deviations from the standard which are commercially acceptable. In the I.C.I. space, the corresponding limit points determine an ellipsoid around the standard point. The tolerance ellipsoids so constructed show excellent correlation in shape and orientation with the MacAdam ellipsoids for perceptible color differences. In the testing of samples, the conversion of color-eye readings to I.C.I. co-ordinates is facilitated by the use of an electrical converter. Deficiencies inherent in filter colorimetry limit the absolute accuracy of the I.C.I. numbers obtained, but do not cause any appreciable error in the measurement of small differences in color. 3 figures and 10 references. K.C.H.

CONTAINER INDUSTRY—LAWS AND LEGISLATION

PARKER, LEO T. How the Uniform Sales Act affects your business. Fibre Containers 38, no. 2: 114, 116, 118, 120-2 (February, 1953).

The ultimate purpose of the Universal Sales Act—a universal law applicable in all states, counties, and municipalities in the United States—is to enable buyers and sellers in all parts of the country to know their legal rights and liabilities with the least time, effort, and expense. Examples of cases and higher-court decisions involving sales contracts are given to illustrate the conditions when an unpaid seller of paperboard and paperboard containers has a lien on the merchandise and when the validity of this lien is forfeited. E.S.

CORROSION

ARESIN. A chapter about corrosion and its causes. Wochbl. Papierfabr. 80, no. 21: 778 (Nov. 15, 1952). [In German]

A few examples of electrolytic corrosion in papermaking machinery are discussed. 3 tables and 1 reference. E.S.

COST—ACCOUNTING

ELLIOTT, NORMAN J. Pricing and estimating. Article 7. Cost estimating . . . setup paper boxes. Boxboard Containers 71, no. 723: 24-7 (March, 1953); *cf.* B.I.P.C. 23: 482.

The author reviews the six types of cost data which form the basis for accurate cost estimating in the box factory. Special reference is made to the accumulation and analysis of the following cost data for setup-box production: materials costs, machine-hour conversion costs, time and waste factors, hauling and storage costs, and small-order setup costs. General suggestions are made for the efficient operation of the estimating process. Final order pricing is based on the job-order cost estimate plus an allowance for cash discounts, a margin of profit, and in some cases, a sales commission. 4 illustrations of cost-estimate forms. L.C.

DECULATOR PROCESS

GAVELIN, GUNNAR. The Deculator. Svensk Papperstidn. 56, no. 3: 107-8 (Feb. 15, 1953). [In Swedish] *cf.* B.I.P.C. 21: 693.

The purpose, construction, and installation of the Deculator are described. 1 diagram. E.S.

DYES AND DYEING

CASPAR, E. C. Optical brightening agents. Textil-Rundschau 8, no. 1: 22-7 (January, 1953). [In German]

Following a brief history of the development of optical bleaching agents (I) particularly for the textile and paper industries, the principles of fluorescence, requirements of satisfactory (I), recent Swiss products, and applications are discussed. 2 figures and 1 reference. E.S.

W. N. Tub-colored papers. Allgem. Papier-Rundschau no. 3: 109-10 (Feb. 12, 1953). [In German]

A brief description of the process of surface dyeing of paper by dipping, the selection of suitable furnishes and dyestuffs, and subsequent creping is given. The method is principally employed for decorative tissues, florist's crepe paper, and similar uses. E.S.

ELECTRIC PRECIPITATORS

THOMPSON, WALTER A. The electro-filter as a secondary recovery device. Pulp Paper Mag. Can. 54, no. 3: 174-7, 180 (Convention, 1953).

The author cites the economic aspects and physical characteristics of the electrostatic precipitator (Cottrell) in recovering soda salts in alkaline pulping. The mechanism of electrostatic precipitation is outlined, and the empirical nature of precipitator design is shown. Functions of various components of the equipment are described, including different design practices, and current developments are discussed. It is pointed out that a conservative design and the provision of various operational aids are the principal contributors to high operating availability and low maintenance costs. 4 figures and 1 reference. E.S.

EVAPORATION AND EVAPORATORS

HALL, W. J. Sulphate black liquor evaporator tube plugging—progress report. Tappi 36, no. 3: 127-30 (March, 1953).

The progress to date is reported on the probable source and mechanism of the tube plugging in a long-tube, vertical, multiple-effect evaporator. The observation of a dissected plugged tube pulled from no. 1B effect of this evaporator and analyses of individual portions of the plug are the bases for the conclusion that the plug is probably composed of black-liquor solids rather than sulfate soap. The solids from cascade washings are also ruled out as components of the plug. Polished cross sections of the tube plug show evidence of scale breaking loose from the tube wall and setting up intricate channels in the liquor space. The plug probably forms after this initial scaling. It is believed that the formation of the remainder of the plug can be prevented by control of the scale. The presence of superheat in the steam to the evaporators is noted. This would tend to aggravate the tube scaling, which is believed to be the initial phase of plug formation. To inhibit the accumulation of scale, recommendations are made to desuperheat the steam used for evaporation and to initiate more effective boiling-out procedures. 2 tables, 5 figures, and 4 references. E.S.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

ANON. Evaporator has Scotch touch. Chem. Eng. 60, no. 3: 140-2, 144 (March, 1953); *cf.* B.I.P.C. 23: 360.

A similar description of the new unit for the recovery of spent sulfite liquor at Rhinelander, Wis. is given as in the previous references. 2 flowsheets. E.S.

DINSMORE, ROBERT FRANK. Long tube, forced circulation evaporation of sulphite waste liquor. Paper Mill News 76, no. 7: 14, 16-20 (Feb. 14, 1953).

Comparatively scant data are reported in literature on long-tube, forced-circulation evaporators, especially on their application to spent sulfite liquor. The purpose of the present investigation was a study of the operating characteristics of such digesters for concentrating ammonia-base spent liquor and to determine over-all coefficients which would aid in the design of evaporators for recovery processes. A Goslin-Birmingham evaporator was employed, the details of which are described, as well as the methods for obtaining data, experimental procedures, and calculations. The following results were obtained when operating with both water and ammonia-base spent sulfite liquor: The operation of the evaporator is quite simple, once steady-state conditions have been reached. No foaming occurred, except during the warm-up period with a low percentage of solids. The heat-transfer coefficients for water increased with increasing temperature difference. The over-all coefficients decreased with increasing concentration of waste liquor; the high viscosity of the spent liquor at a high percentage of solids is believed to be responsible for this fact. Heat-flux densities for the liquor averaged 64% higher than similar figures reported by the Swenson Evaporator Co. for soda black liquor in the same type of evaporator. The coefficients obtained for water ranged from 271 to 410 B.t.u./hour/sq. ft./degree Fahrenheit temperature difference, whereas the over-all coefficients obtained for the spent liquor varied from 164 to 296 B.t.u./hour/sq. ft./degree Fahrenheit temperature difference. Heat losses from the evaporator were negligible. 9 figures and 8 references. E.S.

EDWARDES, VANCE P. Problems connected with waste sulphite liquor collection, evaporation and burning. Paper Trade J. 136, no. 9: 14-18 (Feb. 27, 1953); Paper Mill News 76, no. 18: 12, 16 (May 2, 1953). [Abridgment]

The author discusses the problems in spent liquor evaporation and burning still to be solved on the North American continent before the process can be considered technically successful, aside from the question of economics. He covers liquor concentration, collection, sulfur trioxide content of the spent liquor, evaporation and evaporators, scale prevention, and burning. The present status of soluble bases is outlined briefly. With either calcium or soluble-base liquor the installation costs of efficient liquor-recovery equipment will be substantial and may even approach or, possibly, exceed the cost of evaporating equipment and the furnaces. Most of the technical problems of evaporation have apparently been solved by the use of the channel-switching type of plate evaporator, although trouble will still be experienced if the sulfate content is high. The installation is expensive, and operating and maintenance costs will probably be considerable. Concentrated spent liquor, irrespective of base, can be burned alone or with auxiliary fuel quite successfully in properly designed equipment. The burning of calcium-base liquor introduces the serious problem of air pollution from fly ash and the sulfur dioxide content of the stack gases. New or improved equipment will have to be developed for fly-ash removal from the gases, because present installations are not very effective. 2 tables and 3 figures. E.S.

KANN, FRED. The application of magnetic fields for preventing deposits during the concentration of spent sulfite liquor. Das Papier 7, no. 3/4: 62-4 (February, 1953); Papier, carton et cellulose 1, no. 6: 66-8 (January-February, 1953). [In German and French]

An electromagnetic system CEPI-VE (patent Vermeiren) is described which is installed in the piping through which the spent calcium-base beech sulfite liquor is fed to a Ramén quadruple-effect vacuum evaporator, and which is claimed to activate the liquor so that the formation of crystal lattices and deposits on the heating surfaces are prevented. In addition, the activated liquor was also found to dissolve and eliminate existing incrustation; the effect was the weakest in the sections most remote from the source of activation. After the system had been in operation for some time, no new deposits were observed, although an amorphous sludge was formed in the last two effects where the solids amounted to 31 and 56%, respectively. This sludge was deposited on the walls of the last effect; however, in contrast to the previous crystalline crusts, it could easily be rinsed off with water. The advantages of the procedure are discussed. The investigations with the system are not yet concluded and the studies are being continued. 5 figures. E.S.

O'DONOGHUE, J. P., GODDARD, H. O., and HELLEUR, D. Medium pressure steam concentration of waste sulphite liquor—II. Pulp Paper Mag. Can. 54, no. 3: 230-8 (Convention, 1953); *cf.* B.I.P.C. 20: 559-60.

Further pilot-plant tests of the concentration of spent sulfite liquor by medium-pressure steam are described. The results of these tests show that, with suitably designed equipment, it is possible to operate continuously at sustained capacity. Flow diagrams which illustrate how this concentration method can be adapted to the sulfite mill are included. 16 figures and 2 references. E.S.

ENZYMES

JERMYN, M. A. Fungal cellulases. I. General properties of unpurified enzyme preparations from *Aspergillus oryzae*. Australian J. Sci. Research 5B, no. 4: 409-32 (November, 1952).

The culture filtrate from *Aspergillus oryzae* contains enzymes capable of depolymerizing sodium carboxymethylcellulose (I) and of splitting all β-glucosides tested. These enzymes are produced by the mold in the absence of cellulose or any other carbon source containing β-glucosidic linkages. The action of the enzyme degrading (I) (the C_x enzyme of Reese, Siu, and Levinson, *cf.* B.I.P.C. 20: 706-7) and the β-glucosidase activities were followed iodometrically. The β-glucosidase action was also followed colorimetrically using *p*-nitrophenyl-β-glucoside as a substrate. The variation in the activity of the C_x enzyme with temperature, pH, and enzyme and substrate concentrations, and in the presence of inhibitors, was measured and some kinetic data are also given for the β-glucosidase activities. On the basis of these results it is concluded that the physiochemical properties of (I) solutions make this compound an unsatisfactory substrate for kinetic studies. The true pH optimum of the C_x enzyme is about 3.5; the apparent temperature optimum is very strongly influenced by reaction time. The behavior of the C_x enzyme toward metal-complexing, oxidizing, and reducing agents can be explained if it is activated by ferric ions but the method of enzyme estimation used and the complexing properties of sodium carboxymethylcellulose make proof of this hypothesis difficult. The enzyme activity is also strongly affected by various organic bases, notably caffeine and quinine. The behavior of a β-glucosidase (salicinase) toward various reagents affecting the C_x enzyme has also been tested. 8 tables, 8 figures, and 35 references. E.S.

JERMYN, M. A. Fungal cellulases. II. The complexity of enzymes from *Aspergillus oryzae* that split β-glucosidic linkages, and their partial separation. Australian J. Sci. Research 5B, no. 4: 433-43 (November, 1952).

Filter paper electrophoresis and paper chromatography have been used to test the homogeneity of the β-glucosidase of *Aspergillus oryzae*. In the crude enzyme preparation there are at least eight components capable of breaking β-glucosidic linkages and showing varying degrees of specificity towards different substrates. These are active not only in splitting simple glucosides but also in depolymerizing sodium carboxymethylcellulose. The only exception is provided by the enzymes splitting *p*-nitrophenyl-β-glucoside, which are sharply limited to two closely related components. This two-component mixture has been partially purified from accompanying enzymes. Neither the postulate of a single β-glucosidase nor that of a specific enzyme for each substrate will fit the experimental results. It also appears that the concept of an enzyme (C_x) specified for polymeric β-glucosides and qualitatively different from other β-glucosidases must be abandoned in this instance. Attempts to separate and purify various enzymes have given results in harmony with the hypothesis of multiple-enzyme components. 2 tables, 4 figures, and 10 references. E.S.

FEED WATER

VALLEY, E. E., and HANLON, R. T. Modification of the feedwater treatment system at Port Arthur Division, Provincial Paper Limited. Pulp Paper Mag. Can. 54, no. 3: 190-4, 201 (Convention, 1953).

To maintain the dissolved-solids content of the boiler water at less than 1000 p.p.m., steam contamination emanating from carry-over at the Port Arthur Division of Provincial Paper, Limited resulted in the excessive blowdown of the boilers. In addition, increasingly serious corrosion of the condensate-return system caused excessive maintenance of the piping equipment and contributed to the high iron content of the boiler water. Several

means of precluding these conditions were investigated, and the acid-cycle, cation-exchange system of water treatment was selected for the installation at this plant. The results of a plant-corrosion test after this system was installed and the operating experiences in connection with this method of softening are reviewed. 5 tables and 13 figures. E.S.

FIBER—STRUCTURE

Asunmaa, Saara, and Lange, Paul W. The distribution of the components in the plant cell wall. Part IV. Esterification of the carbohydrates in the plant cell wall with *p*-phenylazobenzoyl chloride for microspectrographic investigation. Svensk Papperstidn. 56, no. 3: 85-90 (Feb. 15, 1953). [In English; German and Swedish summaries] *cf.* B.I.P.C. 23: 404.

As pointed out in Part I of this series (*cf.* B.I.P.C. 21: 395), it is not possible to study the carbohydrates in the plant cell wall by microspectrographic methods in the presence of lignin; after removal of the lignin, a light-absorbing component must be quantitatively combined with the carbohydrates to permit microspectrographic investigations (because the carbohydrates have no selective absorption in the range of 2000-7000 A.). A procedure for this purpose is described which consists in the esterification of the lignin-free cell walls with *p*-phenylazobenzoyl chloride. The fiber-ester structure is shown to be very similar to that of the original fiber. The general shape of the absorption curve for the esterified fibers is the same as that of the light-absorbing component in solution; the maximum of the fiber ester is only slightly shifted toward longer wavelengths. The presence of residual lignin in esterified cellulose fibers is readily detected. 1 table, 10 figures, and 9 references. E.S.

FIBERS

Parsons, H. L. Bast fibres—physics and chemistry. Rev. Textile Progress 3: 44-61 (1951); *cf.* B.I.P.C. 22: 576.

The author surveys the research work on bast fibers published during the year under the following divisions: morphology, fine structure; physical properties; microbiology and retting; chemistry (lignin, hemicellulose, esterification, scouring and bleaching, analysis and testing), and other fibers. 117 references. R.G.K.

FINANCE

Rumpf, A. Newell. Some economic aspects of the pulp and paper industry. Tappi 36, no. 3: 133-5A (March, 1953); Am. Boxmaker 42, no. 3: 19-20 (March, 1953); *cf.* B.I.P.C. 23: 327.

This article gives essentially the same information as the previous reference. 1 table. E.S.

FOAM

Ewers, W. E., and Sutherland, K. L. The role of surface transport in the stability and breakdown of foams. Australian J. Sci. Research 5A, no. 4: 697-710 (December, 1952).

A new theory of foam stability is proposed which demonstrates that the transport of substrate, accompanying a movement of the surface of the bubble film, is a dominant factor in the stability of foams and in the action of foam breakers. The surface moves from a region of low surface tension

(high surface pressure) to a region of high surface tension. The surface-tension gradients arise from disturbances which may be caused by mechanical or thermal shocks, or by the addition to the surface of particles, droplets, or vapor of a surface-active material. When the surface tension is highest at the center of disturbance the film will be stable; when the surface tension is lowest at this point the surface film and hence the substrate will be moved away from this point and the film will rupture. 2 tables and 23 references.
E.S.

FORESTS AND FORESTRY

CANADIAN INSTITUTE OF FORESTRY and SOCIETY OF AMERICAN FORESTERS. Summaries of papers presented at joint meeting of Canadian Institute of Forestry and Society of American Foresters. Pulp Paper Mag. Can. 53, no. 13: 132-3, 136 (December, 1952); 54, no. 2: 84, 86, 88, 91-2, 94-6; no. 3: 304, 306 (February, Convention, 1953).

Abstracts are given of the papers which were presented at the fall, 1952 joint meeting of the societies in Montreal, Canada. L.C.

MALSBERGER, H. J. Conservation report of forester-general manager. Southern Pulp Paper Manuf. 16, no. 3: 34, 36, 40 (March, 1953); *cf.* B.I.P.C. 22: 494.

The most significant advance in the program of the Southern Pulpwood Conservation Association during 1952 was in the field of providing forestry services to landowners. Informational projects, educational material, and methods of publicizing the program of the Association in use during this period are reviewed. E.S.

PAQUET, L. H. Some views on woodlot management. Pulp Paper Mag. Can. 54, no. 2: 78, 81-2 (February, 1953).

The author reviews the history of the Canadian settlers' attitude toward forest utilization and preservation. Recent conservation efforts in the form of such programs as the "Tree Farm" movement which is spreading in the United States are described. It is the duty of the wood-using industries and government forestry agencies to help the small woodlot owner recognize and exploit the value of his forest crop. L.C.

FORESTS AND FORESTRY—EDUCATION

DEAN, GEORGE W. Industry develops youthful foresters at Holiday Lake Camp. Pulp Paper Mag. Can. 54, no. 3: 272, 275-6 (Convention, 1953).

Since 1946 Holiday Lake Camp on the Buckingham State Forest, Va. has been a training camp for boys, 14 to 18 years of age, who show an interest in forestry and who are given an annual week's training in the subject, with the additional aim to encourage school principals to push forestry in their school curriculum. 7 illustrations. R.G.K.

PORTER, EARL [Moderator] What the southern pulp and paper industry is doing about its future supply of pulpwood from non-company owned lands. Southern Pulp Paper Manuf. 16, no. 3: 46, 48, 50, 52, 54; discussion: 54-7, 111 (March, 1953).

The following papers were presented in a panel discussion on "Information and education": Jennings, Dawson M. Educational activities, p. 46, 48,

50; Davis, Ralph A., Jr. Informational projects, p. 50, 52; and Nicholson, James D. Diorama exhibit, p. 52, 54. E.S.

ROBERTSON, C. W. How we tell our story of better forest management. Southern Pulp Paper Manuf. 16, no. 3: 40, 42; discussion: 42, 46 (March, 1953).

The methods employed by one conservation forester of the Southern Kraft Division of the International Paper Co. are described. E.S.

HEATING (INFRARED)

ANON. West Virginia Pulp and Paper Co. drying paper with Red Ray radiant heat burners. Southern Pulp Paper Manuf. 16, no. 3: 86 (March, 1953).

The rebuilt paper machine No. 5 at the company's Covington plant includes a radiant gas burner unit for auxiliary drying. The installation supplied by the Red Ray Manufacturing Co. of New York consists of nine burners extending the full width of the drier under the first nine bottom driers immediately following the press section. This section is operated without felt so that the sheet is in direct contact with the radiant heat emitted by the burners. The method of lighting and switching off the burners, including safety measures, is described. 2 illustrations. E.S.

DÉRIBÉRÉ, M. Infrared drying in the paper and graphic-arts industries. Papeterie 75, no. 1: 27, 29, 31 (January, 1953). [In French]

The principle of drying with infrared rays and applications in the paper and printing industries are reviewed. 2 illustrations and 11 references. E.S.

HISTORY

WIHAN,—. Reminiscences of an old paper-machine constructor. Wochbl. Papierfabr. 81, no. 3: 83-4 (Feb. 15, 1953). [In German]

The author relates some incidents (partly humorous) which happened during his long career as a machinery constructor and trouble shooter. E.S.

INSTRUMENTATION

FRANKLIN, J. N. Application of instrumentation thinking to design and operation of process equipment. Pulp Paper Mag. Can. 54, no. 3: 181-6 (Convention, 1953).

The author attempts to extend the philosophy and thinking of the instrumentation specialist for the benefit of all personnel engaged in the pulp and paper industry, whether they be concerned with automatic control or not. "Instrumentation thinking" or "Process control philosophy" is defined and its connection with every-day operations established, together with its influence on production, efficiency, and profits. The author suggests that product uniformity can be obtained in no other way than by the application of this technique to each and every design problem and each and every operational action in the industry. Examples of the application of this concept are cited in various sections of an integrated pulp and paper mill, as well as the influence of one section on all others. It is emphasized here that, whereas none of the examples used can be expected to apply to all mills, the ideas expressed may be successfully interpreted throughout the industry. The importance of the concept in the industry's educational and training program is considered and the conclusion drawn that it should form the key to success in all such activities. 4 figures. E.S.

WOOLER, A. G. Bleaching pulp. Instrumentation 6, no. 4: 9-12 (January-March, 1953).

The semiautomatic instrumentation and control program at the new bleach plant of the Riegel Paper Corp. at Milford, N.J. is described. The variety of products handled required the installation of three separate bleaching systems (two single-stage and one multistage system). Frequent changes in bleaching operations on various blends and types of stocks did not make a fully automatic system desirable, so that a combination of two panel boards and individual consoles with pushbutton control for each washer or thickener was selected. 6 illustrations. E.S.

KRAFT PULP AND PAPER

EVERY, DERNELL. Unbleached kraft paper review—1952. Paper Trade J. 136, no. 8: 134 (Jan. 20, 1953); Paper Mill News 76, no. 8: 104 (Feb. 21, 1953); Southern Pulp Paper Manuf. 16, no. 3: 65-6 (March, 1953); Am. Paper Merchant 50, no. 3: 28, 60 (March, 1953); Paper & Twine J. 26, no. 12: 14, 16, 18 (February, 1953; Can. Pulp Paper Ind. 6, no. 4: 174 (April, 1953); *cf.* B.I.P.C. 22: 497.

About 2,400,000 tons of unbleached kraft paper were sold in 1952, only 7% less than in the record year of 1951. On the whole, 1952 was a year of apprehension and uncertainties. A sharp midyear decline was followed by a recovery in the third quarter which continued until the end of the year. Two new paper machines were added to the industry's equipment, and three more will be added in 1953. At the present time unbleached kraft paper capacity and demand are in better balance than they have been at any time since the start of the Korean hostilities. All kinds of kraft paper are now available to meet the large and growing needs of an expanding population. E.S.

LIGNIN

ANON. Special chemicals for use in the rubber industry. Ind. Chemist 29, no. 338: 99-101 (March, 1953).

Among the complex organic compounds used as accelerators, antioxidants, and peptizers in the rubber industry, lignin is mentioned as a possibility, although it has shown more promise in synthetic than in genuine rubber. 3 tables. E.S.

FREUDENBERG, KARL, and HEEL, WERNER. Dihydroxy- and trihydroxycinnamyl alcohol. Chem. Ber. 86, no. 2: 190-6 (March 13, 1953). [In German]

Reduction of caffeic acid ethyl ester with lithium aluminum hydride gives 3,4-dihydroxycinnamyl alcohol (coffee alcohol) (I). Similarly, reduction of ethyl 3,4,5-trihydroxycinnamate gives the corresponding alcohol, and reduction of ethyl piperonylacrylate gives piperonylallyl alcohol. Treatment of (I) with mushroom redoxase at pH 7 and 20°C. gives a red-brown dehydrogenation polymer (DHP) (II), which contains 2.5 atoms of hydrogen less than (I). (II) gives the same color reactions and similar ultraviolet absorption spectra as lignin. Mixtures of (I) and coniferyl alcohol give a mixed DHP which also gives the color reactions of lignin. 2 figures and 17 references. F.E.B.

MEREWETHER, J. W. T. Studies on the lignin of *Eucalyptus regnans* F. Muell. V. Ethanol lignin. Australian J. Chem. [previously

called Australian J. Sci. Research A] 6, no. 1: 44-52 (February, 1953); *cf.* B.I.P.C. 21: 170.

Lignin has been isolated from *Eucalyptus regnans* F. Muell by refluxing with ethanolic hydrogen chloride, and the product separated into an ether-insoluble ethanol lignin-A and an ether-soluble ethanol lignin-B. Ethanol lignin-A has an equivalent weight of 1400 and, on the assumption that the molecular weight is of this order, contains two ethoxyl and nine methoxyl groups. Acetic anhydride and benzoyl chloride in pyridine yield, respectively, a heptaacetate and heptabenzoate, whereas benzoyl chloride in aqueous alkali yields a pentabenzoate. Diazomethane yields a dimethyl derivative which gives a pentaacetate on acetylation. Schotten-Baumann benzoylation of this dimethyl derivative yields a dibenzoate. Two carbonyl groups are present, as shown by the formation of a bisphenylhydrazone and a bis-*p*-nitrophenylhydrazone. The data are consistent with the formula $C_{60}H_{88}O_{19}(OC_2H_5)_2(OCH_3)_9(OH)_7$. 3 tables and 16 references. E.S.

LIGNIN—ABSORPTION SPECTRA

AULIN-ERDTMAN, GUNHILD. Spectrographic contributions to lignin chemistry. III. Investigations on model compounds. Svensk Papperstidn. 56, no. 3: 91-101 (Feb. 15, 1953). [In English] *cf.* B.I.P.C. 23: 254-5.

Twenty-one new lignin model substances have been prepared and investigated in connection with work on the ultraviolet absorption properties of lignin compounds. The preparation and characterization of these compounds are described, and the ultraviolet absorption properties of these and other lignin model compounds in various neutral (organic) and alkaline solvents are discussed. 2 tables, 16 figures, and 35 references. E.S.

LIGNIN—MICROBIOLOGICAL DEGRADATION

DAY, WILLIAM C., GOTTLIEB, SIDNEY, and PELCZAR, MICHAEL, J., JR. The biological degradation of lignin. IV. The inability of *Polyporus versicolor* to metabolize sodium lignosulfonate. Appl. Microbiol. 1, no. 2: 78-81 (March, 1953); *cf.* B.I.P.C. 22: 915.

The wood-rotting fungus *Polyporus versicolor* was tested for its ability to utilize sodium lignosulfonate either as a sole source of carbon or combined with glucose in a mineral salt basal medium. It was found by application of dry-weight measurements, mycelial nitrogen and methoxyl determinations, ultraviolet absorption recordings, and glucose determinations that this fungus apparently did not utilize lignosulfonate as a sole carbon source; however, it did remove the lignosulfonate from solution. Proof of this was revealed by methoxyl and ultraviolet absorption results which showed the lignosulfonate to be present in or on the mycelia. It was also noted that glucose enhanced the disappearance of lignosulfonate from solution and that viable cells were required for this phenomenon to occur. The analytical procedures employed in this study presented a rational approach to the evaluation of microbial attack on lignin and related substances. 4 tables, 1 figure, and 11 references. E.S.

LIGNIN—RADIOACTIVE EXPERIMENTS

FREUDENBERG, KARL, and BITTNER, FRIEDRICH. Experiments with coniferyl alcohol containing radioactive carbon. Chem. Ber. 86, no. 2: 155-9 (March 13, 1953). [In German]

Radioactive cyanoacetic acid $NC^{14}CH_2CO_2H$ has been condensed with vanillin and the α-cyanoferulic acid converted via the ferulic nitrile and the acetylferuloyl chloride into the radioactive ethyl ferulate (I). Reduction of

(I) with lithium aluminum hydride and coupling of the coniferyl alcohol (II) with acetobromoglucose gives radioactive coniferin (III). Treatment of (II) with mushroom dehydrogenase at pH 6.5 gives a radioactive dehydrogenation polymer (DHP) with an activity of 133,000 impulses/mg./minute. Oxidative degradation of DHP according to Freudenberg and coworkers (*cf.* B.I.P.C. 9: 67) gives a radioactive isohemipinic acid (IV). A similar degradation of a DHP which has been refluxed eight hours with methanol containing concentrated hydrochloric acid gives an active metahemipinic acid and inactive veratric acid, but no (IV) or dehydrodiveratric acid. When a small amount of (III) is placed under the bark of a young spruce tree, (III) is absorbed within two weeks and converted into low- and high-molecular products which contain over 90% of the active material and are isolated with the lignin. 1 table and 12 references. F.E.B.

STONE, J. E. Studies of lignin biosynthesis using isotopic carbon. I. Long-term experiment with $C^{14}O_2$. Can. J. Chem. 31, no. 3: 207-13 (March, 1953).

Wheat plants were fed with $C^{14}O_2$ at the stage of growth corresponding to rapid lignification. Thereafter, plants were harvested every few days until maturity. The specific and total activity of the plants, and the specific and total activity in some lignin degradation products were determined. The results indicated that: (*a*) $C^{14}O_2$ was still being respired from the plants at maturity; (*b*) all the C^{14} which gets into the lignin does so within 24 hours from the administering of $C^{14}O_2$; (*c*) the total activity originally acquired by the syringaldehyde portion of the lignin remains constant throughout the growth of the plant, that is, the lignin (as represented by syringaldehyde) is a final end product of the plant and is not a part of the respiratory system; (*d*) the total activity originally acquired by the vanillin suffers an initial drop for about two weeks after activation and then becomes constant; and (*e*) the *p*-hydroxybenzaldehyde activity drops continuously throughout the life of the plant. 1 table, 5 figures, and 4 references. E.S.

LUBRICATION AND LUBRICANTS

THE TEXAS COMPANY. Paper mill lubrication. Lubrication 39, no. 3: 29-44 (March, 1953); Southern Pulp Paper Manuf. 16, no. 4: 30, 32, 34, 36, 38-42, 44, 46 (April, 1953).

The correct type of lubrication for the different machinery units used in pulp- and papermaking from woodyard through the paper-machine room is described. 1 table and 17 illustrations. E.S.

MACHINERY

ANON. A visit to the machine factory of O. Dörries A. G. in Düren/Rhld. Wochbl. Papierfabr. 81, no. 3: 82-3 (Feb. 15, 1953). [In German]

The activities of the company, manufacturers of pulp- and papermaking machinery and entire mill installations, are described briefly. 1 illustration. E.S.

ENGEL, KURT. Report of the third Salon International des Techniques Papetières et Graphiques in Paris. Wochbl. Papierfabr. 80, no. 21: 775-8 (Nov. 15, 1952). [In German]

The author discusses some of the outstanding exhibits in the field of papermaking and paper-testing machinery. 2 figures. E.S.

MONTAGNAN, R. Machinery for the manufacture of container board. Papier, carton et cellulose 1, no. 3: 45-51 (July-August, 1952). [In French]

The machinery required for the manufacture of corrugated and solid fiber shipping-container board is described. 12 figures. E.S.

WIHAN,—. Something about machinery spares. Wochbl. Papierfabr. 80, no. 21: 778-9 (Nov. 15, 1952). [In German]

The author discusses some of the difficulties in obtaining replacement parts for old machines in Germany today, with particular reference to lack of correct drawings, lack of specifications, the discontinuance of operations by certain machinery suppliers, etc. E.S.

MACHINERY—BEATERS

ANON. A new heavy-duty continuous hollander with curb and high pressure. Wochbl. Papierfabr. 80, no. 23: 883-6 (Dec. 15, 1952). [In German]

Details of the hooded construction, circulation of the stock, and mode of operation of the new Drautz hollander (I) for batch or continuous operation are given; the stock is fully prepared in the beater and no preliminary or subsequent treatment is required. (I) is constructed in three sizes (for 3000, 5000, and 8000 liters); it may also be constructed with two beater rolls for capacities up to 20,000 liters. 2 diagrams. E.S.

MACHINERY—BELTING

INTERNATIONAL PAPER BOX MACHINE COMPANY, *Nashua, N. H.* Carton blank feeding nuisances minimized. Boxboard Containers 71, no. 723: 35 (March, 1953).

A belt-conditioning device is described which keeps the face of a feeding belt on a carton gluing machine at its maximum frictional capacity; it insures continuous feed by a constant cleaning and slight moistening of the primary feeding belt. This is accomplished by a stream of moist air and the direct contact of a nylon-bristle brush with the surface of the belt. 2 illustrations. L.C.

MACHINERY—BLOWERS

THOMANN, ROBERT. The Sulzer system of water extraction for paper machines. Norsk Skogind. 7, no. 2: 42-8 (February, 1953). [In English; Norwegian summary] *cf.* B.I.P.C. 22: 916.

The article is almost identical with the previous reference. 2 tables and 14 figures. E.S.

MACHINERY—CARTON-FEEDING MECHANISM

CARTON CRAFTSMAN, INC., *Chicago.* Advantages claimed for Elless stream feeder. Boxboard Containers 71, no. 723: 22-3 (March, 1953).

The company has installed an Elless reloading automatic stream feeder (a Swedish development) in conjunction with a two-color Miehle press for carton blanks. This attachment for flat-bed cylinder presses feeds overlapping sheets forward in a continuous stream at a slower rate of speed than that of the press. The stock is suction-cup lifted, separated by air, and forwarded from the trailing edge of the pile. Production from the feeder-equipped press

is said to exceed the output of hand-fed presses by 10%, provided the stock lies flat without curl. In addition, color work is more uniform, and there are fewer stoppages. 7 figures. L.C.

MACHINERY—CALENDER DRIVE

HARRIS, W. R. Regulation systems—key to higher supercalender production. Paper Trade J. 136, no. 7: 22-3 (Feb. 13, 1953).

Automatic regulating systems on modern supercalender drives with rotating regulator threading speed control at 50 f.p.m. and preset productive speed control up to 2000 f.p.m. are described. 4 figures. E.S.

MACHINERY—CHIPPERS

IRVINE, J. E., and HENDERSON, E. W. Wood chipper and chipper motor selection. Pulp Paper Mag. Can. 54, no. 3: 247-52 (Convention, 1953).

The authors demonstrate a method of selecting the proper wood chipper, taking the average diameter of wood supplied, maximum diameter of wood, capacity in cunits of round wood desired, and length of chip required into consideration; smaller chippers of capacities up to 50 cunits/hour and average log diameters of 5 to 8 inches are principally discussed. The selection of a suitable motor is outlined by describing the application of squirrel-cage and wound-rotor induction motors and synchronous motors, including various calculations. 1 diagram and 2 references. E.S.

MACHINERY—ELECTRIC EQUIPMENT

WALTON, E. N. Modernization of electrical distribution system at Powell River. Pulp Paper Mag. Can. 54, no. 3: 210-14 (Convention, 1953).

Heavily overloaded circuits and inadequately rated circuit breakers of the Powell River newsprint mill were bottlenecks to future plant expansion and a threat to uninterrupted production. The overload conditions were eliminated by establishing a higher distribution voltage through a primary 6600-volt ring around the mill and tapping four new primary substations off the ring at heavy load and generation points. The inadequate circuit-breaker conditions were improved by replacing the very old equipment and by protecting the more modern equipment with current-limiting reactors. Design of the new system and specifications for equipment were confirmed by a.c. network analyzer studies. Dispatching and control are handled at a new central control room to which an intercommunication system connects all substations and generator rooms. High-rupturing capacity, current-limiting, 600-volt fuses provide adequate yet relatively inexpensive protection for the 550-volt secondary circuits. 1 table and 7 figures. E.S.

MACHINERY—FELTS

S. W. Felts and the maintenance of their efficiency. Wochbl. Papierfabr. 80, no. 22: 811-12 (Nov. 30, 1952); 81, no. 1: 7-8 (Jan. 15, 1953). [In German]

A brief review of American developments is presented, including the use of nylon fibers in felts, the beneficial effect of polyphosphates as washing agents, and studies for determining the reasons for plugging and short felt life. Comments by a German feltmaker (Heimbach in Düren) are given in the second reference. E.S.

MACHINERY—GRINDERS

WINCHESTER, A. J., and CUTHBERTSON, A. M. High-load grinding. Pulp Paper Mag. Can. 54, no. 3: 195-201 (Convention, 1953).

Demands for increased production have stimulated the interest in grinding at high specific loads. To obtain information as to the experience of various mills in high-load grinding, the Mechanical Pulping Committee of the Technical Section, C.P.P.A., circulated a questionnaire, the results of which are presented. Opinions as to whether high-load grinding is a satisfactory means of meeting demands for increased production vary from a categorical "no" to an equally definite "yes." When grinding at increased load, most mills burr lighter and more frequently, but use the same burr. The majority found higher loads produce a bulkier, coarser, chunky type of stock, though one mill found an improvement in quality. Regarding the effect on grinder operation, no very definite trend is shown. As to paper-machine operation, several mills found high-load stock detrimental, one beneficial. Two mill trials are also described. In the first, the specific load on a line of magazine grinders was dropped from 0.81 to 0.65 h.p./sq. inch of grinding surface for one month. Conclusions here were that higher load led to poorer load control, a chunkier type of fiber and that, in order to avoid making a lot of shives, it is necessary to burr very lightly and so produce a lower-freeness stock. In a second mill trial, a machine run of several hours was made on high-load stock. The freeness was appreciably lower than standard, but once the machines were adjusted for this, the stock showed good running qualities, and a newsprint sheet of standard specifications was produced at usual speeds. Well substantiated conclusions cannot be drawn at this stage, but it is hoped that this report may give rise to discussion and further consideration of the possibilities of producing groundwood at high specific load. Questions and mill replies are presented in tabular form. 3 tables. E.S.

MACHINERY—GUIDE ROLLS

BOURQUE, M. Three section aluminum draw roll. Pulp Paper Mag. Can. 54, no. 3: 178-9 (Convention, 1953).

A 5-inch draw roll is required on newsprint machines to guide the sheet from the couch to the first press. Below 1100 f.p.m. the aluminum draw roll remained in balance; however, at higher speeds whipping of the roll (thereby breaking the sheet) can no longer be prevented. A three-sectional roll is described which overcomes the trouble successfully. The invention obtained the first prize in the Canadian gadget competition. 3 figures. E.S.

MACHINERY—MIXING APPARATUS

JACKSON & CHURCH COMPANY, *Saginaw, Mich.* High density bleach mixer. Paper Trade J. 136, no. 1: 22 (Jan. 2, 1953); Chem. Eng. 60, no. 3: 240 (March, 1953); Chem. Processing 16, no. 2: 102-3 (February, 1953).

The mixer has been principally applied to peroxide bleaching, but it can also be used with chlorine, hypochlorite, or caustic soda. It has horizontal disks and a vertical shaft. The high-density pulp (about 35% consistency) is introduced at the top and reduced to a fluffy mass of individual fibers between the disks; at about two thirds from the inlet, the bleach solution is added through nozzles and almost instantly absorbed in the fiber without appreciable dilution. This fact and the intense agitation will result in a faster reaction, lower bleach consumption, and more uniform bleach distribution. 1 illustration. E.S.

MACHINERY—PRESSES

HOLTBRÜGGE, ERICH. What should be known about hydraulic presses. Wochbl. Papierfabr. 80, no. 21: 779-80 (Nov. 15, 1952). [In German]

With reference to defective pressing of shoeboard in a hydraulic press, the author emphasizes the need for understanding the construction and operation of such a press and gives a brief description of its fundamental principles. 1 diagram. E.S.

MACHINERY—ROLLS

SMITH, G. M. Roll alignment checking device. Pulp Paper Mag. Can. 54, no. 3: 179-80 (Convention, 1953).

The construction and application of an assembly for checking the alignment of rolls with much greater speed and accuracy than hitherto possible are described. The invention obtained the second prize in the Canadian gadget competition. 5 figures. E.S.

MACHINERY—SAWS

ADAIR, NELSON T. Basic suggestions for the care and filing of chains on power saws. Pulp Paper Mag. Can. 54, no. 3: 279, 283 (Convention, 1953).

Fundamental rules for the care and filing of different types of chain saws are given. R.G.K.

MACHINERY—SCREENS

KINNEY, S. P. New automatic self-cleaning strainer. Paper Mill News 76, no. 12: 122 (March 21, 1953); Southern Pulp Paper Manuf. 16, no. 3: 99-101 (March, 1953).

The strainer consists essentially of a rotating drum into which straining elements are built; the liquid to be strained enters through an inlet at the bottom of the housing and rises on the outside of the drum. The liquid passes through the drum, whereas the dirt and foreign matter are retained on the surface. By an automatic reversal of flow the foreign matter is washed from the strainer elements. A variety of straining media is available from which the most suitable type for a specific application may be selected. In the case of extremely dirty liquids the installation should include several strainers installed in series. 2 illustrations in the first and 3 in the second reference. E.S.

MACHINERY—STOCK PROPORTIONING METERS

ANDERSON, F. I. Circular-orifice-type continuous stock proportioner. Pulp Paper Mag. Can. 54, no. 3: 187-9 (Convention, 1953).

The author describes the development and operation of a stock-proportioning unit designed, made, and in use on high-speed newsprint machines at the Thunder Bay mill of the Abitibi Power & Paper Co., Limited. 4 figures. E.S.

MACHINERY—VORTEX-TYPE DIRT SEPARATOR

K-LA, L. Some experiences gained with the Centri-Cleaner. Paper and Timber (Finland) 35, no. 2: 56-7 (February, 1953). [In Finnish] *cf.* B.I.P.C. 23: 336.

The construction and mode of operation of the Centri-Cleaner are described and the results obtainable with the equipment are discussed. 1 figure and 3 references. E.S.

MILL CONSTRUCTION

SANDWELL, P. R. Papermaking in the second industrial revolution. Pulp Paper Mag. Can. 54, no. 3: 170-3 (Convention, 1953); Can. Pulp Paper Ind. 6, no. 4: 40, 44, 46, 48, 50 (April, 1953).

In the first annual Stadler memorial lecture, the author discusses the effect of the first and second phase of the "industrial revolution" on paper in its traditional form as carrier of the printed word, particularly of the daily news. Both papermaking and printing were among the first to feel the effects of technical changes. Both profited by the first phase: the replacement of the human hand by power-operated machinery; these effects ceased to be felt in a tangible sense at the beginning of the present century. Both industries should profit from the current phase: the intensified application of physical and mathematical theory to industry. The effects of this current phase are examined. The author's principal conclusion is that since the turn of the century a precarious progress has been maintained by restoring to size, which has resulted in an enormous financial burden involved in the construction of new mills. With regard to raw materials (which become more remote or difficultly accessible all the time), sources of energy, finance and marketing, and available manpower, new paper mills of contemporary design are by their size directly opposed to what is required. The need is for moderately sized mills with greatly reduced capital cost of construction, consisting of light continuous automatic equipment built as far as possible for outdoor operation (also in northern climates). These should be arranged very much, as at present, in a compact grid and controlled from control stations connected together for quick communication. Research and development directed to this end should be of considerable value. 2 tables. E.S.

NEWSPRINT—STATISTICS

ZIMA, JOHN J. Annual newsprint paper review—1952. Paper Trade J. 136, no. 8: 160-4, 166 (Feb. 20, 1953); Paper Mill News 76, no. 16: 87-8, 90, 93-4, 96, 116 (April 18, 1953); *cf.* B.I.P.C. 22: 504.

North American newsprint production in 1952 attained the all-time high volume of 6,834,000 tons, exceeding the 1951 peak output by nearly 3%. This amount represents about 64% of the probable world aggregate of approximately 10,600,000 tons. Of the North American total, about 17% or 1,147,000 tons were made in the United States, whereas 83% or 5,687,000 tons were produced in Canada. The North American newsprint mills in the aggregate operated in 1952 about 2% in excess of theoretical capacity, the sixth consecutive year of greater-than-capacity operations. Statistical data on shipments, mill stocks, exports and imports, consumers' stocks, and consumption are given. 3 tables and 1 diagram. E.S.

NOMOGRAPHIC CHARTS

CHEMICAL PROCESSING. Density of sodium hydroxide in concentrated solution. Chem. Processing 16, no. 3: 218 (March, 1953).

Based on data supplied by the Dow Chemical Co., a nomograph is presented which provides a quick method of estimating the solution concentration when density and temperature are known; the nomograph agrees within about 0.5% sodium hydroxide of the values listed in tabulated data. 1 figure. E.S.

HAUGH, R. R. This handy chart tells right carton size in a jiffy. Food. Eng. 25, no. 3: 79, 198 (March, 1953).

A nomograph with explanatory text is presented for the rapid and simple determination of the least possible surface area of a container to enclose a given volume. Cost is a direct function of the surface area used; the length and depth of the carton should be as nearly equal as possible and each should be double the width to obtain the container at minimum cost. 1 diagram. E.S.

ORGANOLEPTIC TESTING

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Odor of packaging materials. Tappi 36, no. 3: 146-8A (March, 1953).

The text of TAPPI Suggested Method T 483 sm-53 for determining the presence of foreign or objectionable odors in packaging materials by a test panel organized for this purpose is described. 1 table and 6 references. E.S.

PACKAGING

ANON. School days! Packaging Parade 21, no. 242: 60-1, 74 (March, 1953).

The Miles Kimball Co., Oshkosh, Wis., a mail order business handling a variety of products of all shapes and sizes, employs seasonal workers for manual packaging operations. Through training and periodic inspection by the quality-control department, the packers are instructed in the economical and effective use of packaging materials to produce standard packages. The four basic packs and the packaging school are described. 7 illustrations. L.C.

ANON. Sheet plastics used by packaging industry. Brit. Plastics 26, no. 285: 38-43 (February, 1953).

Examples of applications of packaging in polyvinylchloride, polyethylene, and cellulose acetate films, and polyethylene-coated paper or foils are given. 15 illustrations. E.S.

CHEMICAL WEEK. Bagging a new market. Chem. Week 72, no. 13: 58-9 (March 28, 1953); *cf.* B.I.P.C. 23: 188.

The flexible-film packaging (cellophane laminated to polyethylene) of frozen orange juice and the possibilities of this method in other fields are discussed. 2 illustrations. E.S.

KIMBERLY-CLARK CORPORATION. Slippery, but they packaged it. Packaging Parade 21, no. 242: 114-18 (March, 1953).

The company has developed a corrugated box which makes possible the unitizing of coated calendered printing paper in 150-pound lots; previously, a wood case holding 600 pounds had been in use. The tendency of this paper to slip, shift, and break open cartons in transit had hitherto prevented packaging in small lots. The telescope cartons are made of 350-pound test, double-wall, corrugated board and are lined with waterproof asphalt kraft sheets. They are sealed by a vertical application of pressure-sensitive, rayon-filament tape which is applied while the box is under pressure; the effect of pressure is to make a rigid unit of the separate sheets of paper. This packing method and the loading of an expendable pallet are described. 12 illustrations. L.C.

KOTTE [HANS] The preparation of the blanks for the Eco-package. Allgem. Papier-Rundschau no. 1: 14-18 (Jan. 12, 1953). [In German] *cf.* B.I.P.C. 23: 422.

The manufacture of the rectangular central section, the separate tops and bottoms, and the assembling of the carton are described. 9 illustrations. E.S.

PACKAGING—OPENERS

ANON. Tear-tape shipper. Modern Packaging 26, no. 7: 83-5 (March, 1953); *cf.* B.I.P.C. 23: 265.

General Mills, Inc., Minneapolis has adopted a shipping container with a tear-tape opener which splits the B-flute corrugated carton into two usable portions: a retail display pallet for the contents and a flapless carry-out case to be used at the check-out counter. The ¼-inch pressure-sensitive filament tape is automatically applied to the inner liner of the container blanks at a speed of over 60 blanks per minute. The appearance of the carton and the automatic application of the tape are described. 7 illustrations. L.C.

PAPER—DEFECTS

R. How can the dusting of printing papers be prevented? Allgem. Papier-Rundschau no. 24: 1063-4 (Dec. 22, 1952). [In German]

In a brief note, the author shows how the dusting tendency inherent in printing papers can be prevented or minimized by the correct furnish selection, beating, sizing, fillers, coating agents, drying, and smooth, clean cylinders in contact with the paper web. E.S.

PAPER—PACKING

ANON. Paper wrapping for export. Allgem. Papier-Rundschau no. 2: 45-6 (Jan. 26, 1953). [In German]

The handling of paper in bales or rolls for export shipments in steamers is described to emphasize the importance of adequate wrapping. 5 illustrations. E.S.

PAPER—SHEET FORMATION

HENDRY, I. F., MARDON, J., SCRUTON, H., and WILKINSON, D. M. Drainage on a tissue machine wire table. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 33, no. 3: 603-53; discussion: 654-8 (December, 1952); Paper-Maker (London) 124, no. 5: 396 (November, 1952). [Summary]

The results of a study of the variation of the through fraction (*cf.* Bienkiewicz and co-workers, B.I.P.C. 23: 208-9) are discussed, with reference to basis weight and machine variables. Some typical complete flow measurements on the Fourdrinier wire are presented, and the formation of the web is considered with reference to the action of the table rolls (dandy-type, plain, or grooved) and scrapers. The drainage coefficients of various furnishes on a laboratory apparatus are reported and compared with that calculated from scraper discharges on the paper machine (of the order of 1×10^{-4} f.p.s. units). A drainage equation and its application are discussed, and predicted and observed values are compared. 27 tables, 28 figures, and 16 references. E.S.

PAPER AND PULP INDUSTRY

ANON. The provision of Belgium-Luxembourg with forest products. Norsk Skogind. 7, no. 2: 37-41 (February, 1953). [In Norwegian]

Statistical data for the Belgian lumber and pulp and paper industries for the period 1948-51 are given. 11 tables. E.S.

CHEMICAL ENGINEERING. Paper slumps and recovers. Chem. Eng. 60, no. 3: 194 (March, 1953).

Developments in the industry during 1952 and the future outlook are reviewed briefly. 1 diagram. E.S.

EVANS, JOHN C. W. Canada's pulp and paper industry in 1952. Paper Trade J. 136, no. 8: 128-9 (Feb. 20, 1953).

In reviewing the trends in the Canadian industry, reference is made to a moderate decline of 3.5% in the total production of the mills during 1952 from the high record in 1951. Newsprint production was still 3.1% higher, whereas chemical pulp was approximately 7%, paperboard about 10%, and fine papers about 12% lower than in the preceding year. 1 table. E.S.

FOWLER, R. M. C.P.P.A. President's report for the year 1952. Pulp Paper Mag. Can. 54, no. 3: 141-2, 377-8, 381-2, 384 (Convention, 1953); *cf.* B.I.P.C. 22: 595.

In 1951 the over-all output of the Canadian pulp and paper industry declined 3.5% from the record high of 1951, but demand was still at a high level. Export markets, particularly for pulps, were sharply reduced from the unusually high levels of the previous year. Newsprint exports to the United States were slightly greater than in 1951, whereas domestic demand for fine, wrapping, and other papers declined to the 1950 level. Included among the significant developments in the industry during the last year were: the disbanding of the Pulp and Paper Division of the Department of Defence Production and the removal of its distribution controls; an increased effort to further both fundamental and applied research; and unusually protracted wage negotiations accompanied by wage rises throughout the industry. The need for good woodlands management, the activities of the association, and the relation of the Canadian pulp and paper industry to world trade are also discussed. 1 table. L.C.

FOWLER, R. M. Pulp and paper 1945-1952. Pulp Paper Mag. Can. 54, no. 3: 137-40 (Convention, 1953); *cf.* B.I.P.C. 22: 596.

The author reviews the expansion of the pulp and paper industry in Canada from 1945 to 1952. Although 1952 did not match the 1951 production record it was, nevertheless, a good year with sufficient demand to call for operations close to the expanded capacity and an improvement in demand for products which had earlier been slack. Gross production has jumped approximately $800 million since 1945; about $600 million has been invested in plant construction and equipment and over $360 million has been spent on repairs and maintenance. This represents a reinvestment of 60% of the industry's net profit for the period; the profit has averaged under 7% of the total net worth during the seven years and is regarded by the author as defensible and not exorbitant. The continued rise in manufacturing costs points out the need for cost reduction efforts. One of the burdensome cost items is continued excessive taxation in spite of treasury surpluses. Labor costs are also high, but a continued rise is not anticipated here. The author concludes by warning the industry against permitting the excessive intrusion of the government into business affairs. L.C.

PORTER, REED R. Market pulp outlook. Paper Trade J. 136, no. 8: 138-40 (Feb. 20, 1953); Paper Mill News 76, no. 8: 132-4 (Feb.

21, 1953); Pulp & Paper 27, no. 3: 30-1 (March, 1953); *cf.* B.I.P.C. 22: 507.

The effect of inventory cycles on market pulp and the recovery toward the end of 1952 are reviewed. The basic trends of demand and supply are analyzed to predict the 1953 outlook. In 1952, less than 15% of the market pulp used in the United States came from abroad; the output of U. S. market pulp has increased from 31.3 to 46% of the total, and the Canadian contribution to the U. S. market-pulp supply jumped from 13.8 to about 40% during recent years. The importance of the continued development of these two sources is stressed. In general and barring unforeseen developments, 1953 should be a good year. 2 tables and 2 diagrams. E.S.

RITCHIE, JAMES L. Outlook for wood pulp. Paper Trade J. 136, no. 8: 135-7 (Feb. 20, 1953); Paper Mill News 76, no. 8: 98, 100 (Feb. 21, 1953); Southern Pulp Paper Manuf. 16, no. 3: 78, 80 (March, 1953); *cf.* B.I.P.C. 22: 509.

The industry is just emerging from the consequences of an inventory cycle; over-all consumption of wood pulp has not declined as sharply during the 1952 recession as might have been expected. Domestic production was less than 1% below that of the record in 1951, although operating rates in the pulp industry were far below those of the previous year. In recent months they have been responding to the improved conditions in the paper and board industries, so that a great many pulp producers are now operating at or near their absolute capacity. Market wood-pulp production declined 3% and imports 24% during 1952; an improvement is expected as soon as inventory cycles in the United States and in other world markets have been completed. 2 tables in all three and 1 graph in the first reference. E.S.

PAPER AND PULP INDUSTRY—EDUCATION

SMITH, W. G. Bowater's prove value of systematic vocational training. Pulp Paper Mag. Can. 54, no. 2: 44-8 (February, 1953).

Bowater's Newfoundland Pulp and Paper Mills Limited opened its vocational training department in 1950. The establishment, operation, and progress of the program are described. Three stages of training have been established: basic shop training and classroom instruction, service in various departments with related classroom instruction, and intensive field and class training in the chosen trade. Although the training has hitherto been directed primarily toward maintenance employees, the program is being expanded to include stenographic and secretarial personnel and other classes of employees. 5 reproductions of apprentice appraisal records and 2 illustrations. L.C.

PAPER AND PULP INDUSTRY—PUBLIC RELATIONS

THOMSON, DWIGHT J. Community relations in action. Paper Trade J. 136, no. 8: 77-9 (Feb. 20, 1953); Paper Mill News 76, no. 8: 110, 112 (Feb. 21, 1953).

The author describes the philosophy and activities of the community relations program of the Champion Paper and Fibre Company. E.S.

PAPER AND PULP MILLS

ANON. The most modern bleached straw pulp mill in the world. Papeterie 75, no. 1: 9, 11, 13, 15-16 (January, 1953). [In French] *cf.* B.I.P.C. 23: 113.

A somewhat more detailed description of the new Celdecor-Pomilio straw pulp mill in Arnhem, Holland is given than in the previous references. 13 illustrations. E.S.

ANON. Pictures of Svenska Cellulosa Aktiebolagets different industries. Svensk Papperstidn. 56, no. 4: 135-43 (Feb. 28, 1953). [In Swedish]

Illustrations of the different mills and activities of the Swedish corporation are given. 1 map and 29 figures. E.S.

FIBRE CONTAINERS. St. Regis starts new Jacksonville mill. Fibre Containers 38, no. 2: 54, 56, 58, 63 (February, 1953); *cf.* B.I.P.C. 23: 427.

The kraft pulp, paper, and board mill at Eastport, Fla. is described. 4 illustrations. E.S.

WEST VIRGINIA PULP AND PAPER COMPANY. A progress report. Paper Trade J. 136, no. 7: 14-17 (Feb. 13, 1953).

A brief report on the modernization and expansion programs of each of the company's six mills at Charleston, Covington, Luke, Tyrone, Williamsburg, and Mechanicville is presented, including details of the company's pulpwood-supply situation and a brief notation on the research and development program. 1 map, 6 aerial photographs, and 2 diagrams. E.S.

PAPER FINISH

ANON. Onion-skin, a new British surface finish for stationery stock. Brit. Printer 65, no. 389: 45 (March-April, 1953).

Reference is made to a new finish recently introduced on the British market by Wiggins Teape after installation of a Carrier-Ross cockle-finish drier at their Buckland Paper Mills at Dover, Kent. To produce this finish, a sheet of paper is first led through a bath of gelatine size and the surplus is removed by a pair of rolls. The sheet then passes into the drier and receives a blast of hot air; within a few seconds the cockle appears. To make it permanent, the sheet must travel through three closely controlled diminishing temperatures in succeeding sections of the drier without the slightest lateral tension or excessive web pull. The cockle is more pronounced in the lighter weights. Eight cockle-finished letterheads printed on papers of different basis weights are included in the issue. E.S.

PAPER SPECIALTIES

BONE, R. I. Labels for industry. Brit. Printer 65, no. 389: 46-7, 69 (March-April, 1953).

The practical and technical considerations are discussed which must be taken into account in the design of labels for industrial use—i.e., those which simply designate contents and maker and are not intended for high-pressure publicity; they include fitness for purpose, legibility, distinctiveness, the shape and color of the package, the nature of its contents, and the extent to which it will be exposed to light and atmosphere. As examples of good label design, a range of a label family for the new products of the Plastics Division of Imperial Chemical Industries is reproduced in color and discussed. The examples demonstrate how very effective one color can be when handled by an experienced artist. 14 illustrations. E.S.

JÄGER, REINHOLD. Printing paper with "double volume." Allgem. Papier-Rundschau no. 23: 1030-1 (Dec. 12, 1952). [In German] *cf.* B.I.P.C. 23: 345.

Comments to the previous article published under this title are presented in which the author claims that the term "double volume," i.e., volumetric weight, is well known in the printing trade. The significance of the term is discussed and examples of applications are given. 7 tables. E.S.

JAKSTEIN, WERNER. Playing cards from five centuries. Allgem. Papier-Rundschau no. 23: 1027-9 (Dec. 12, 1952). [In German]

The Bielefelder Spielkarten G.m.b.H. owns a collection of nearly 8000 playing cards of different periods and countries. With reference to a present exhibit, some of the specimens are discussed, particularly from the decorative angle. The manufacture as such is not mentioned. 15 illustrations. E.S.

MURDOCK, HAROLD R. Tsuso-rice paper. Paper Trade J. 136, no. 7: 18 (Feb. 13, 1953).

Tsuso-rice paper is neither paper nor is it produced from the rice plant; it is the thinly sliced pith of a small tree in Formosa, which belongs to the *Araliaceae* family. The rice-paper misnomer, originated by the English, reportedly arose from the misconception that this sliced pith came from the rice plant. The author describes the cultivation of the tree, harvesting (three cuttings, the last when the tree is in the seventh year of growth), and the manufacture of pith paper which requires only a sharp knife and a slicing board. The present production is meager. E.S.

WOLPER, PAUL K. Applications of glassine paper in food packaging. Food Technol. 7, no. 3: 126-31 (March, 1953).

Following a brief outline of the manufacture and conversion (printing; hot-melt, solvent, and extrusion coating; and laminating) of glassine paper, its laboratory evaluation for weight, physical strength, greaseproofness, transparency, heat-seal and blocking resistance, and water-vapor permeability (including package-storage tests) is described. In conclusion, specific examples of food packaging in converted types of glassine paper are cited to illustrate some of the basic principles involved. 3 tables, 7 figures, and 21 references. E.S.

PENETRATION

STAMM, ALFRED J. Diffusion and penetration mechanism of liquids into wood. Pulp Paper Mag. Can. 54, no. 2: 54-63 (February, 1953).

The present knowledge of the passage of gases, vapors, liquids, and dissolved materials through wood is reviewed by considering the movement of each under different motivating forces. Specifically, previous and new data on the mechanism of penetration of pulping liquors into chips or blocks with chip lengths are considered. The new data show that the rate of natural penetration of water into wood in the fiber direction at different temperatures varies as the vapor pressure and the inward diffusion of the vapor. The possibilities of capillary rise controlling the rate are ruled out by the fact that changes in rate with changes in temperature do not correlate with the square root of the surface tension divided by the viscosity (the capillary rise constant). Calculations show that only about 14% of the take-up of water can be due to diffusion, but nevertheless it controls the rate of absorption. The

rate of swelling closely follows the rate of absorption. Both the rate of absorption and the rate of swelling are greatly increased by evacuating air from wood, which greatly increases the rate of diffusion of water vapor into the wood and avoids the considerable retarding effect resulting from back pressure of air. Steaming of wet wood increases the rate of absorption considerably over mere soaking. Prepenetration of dry wood with ammonia increases the rate of absorption almost to that obtained by evacuation; this method may have possibilities as a rapid means of impregnating dry chips with cooking liquor in commercial pulping. 2 tables, 7 figures, and 34 references. E.S.

PHYSICAL TESTING—PAPER

FIEBIGER, HARALD. The measurement of air permeability and water absorptiveness; two simple testing methods which can readily be performed in practice. Allgem. Papier-Rundschau no. 1: 12-14 (Jan. 12, 1953). [In German]

The author describes the Potts air-permeability test (*cf.* B.I.P.C. 7: 348-9) and the TAPPI Standard T 441 m-45, "Water absorptiveness of nonbibulous paper and paperboard," which is based on the Cobb size-testing procedure (*cf.* B.I.P.C. 4: 193-4). 1 table, 2 figures, and 9 references. E.S.

PHYSICAL TESTING—PAPER—BASIS WEIGHT

BRUNTON, D. C. The betameter. Pulp Paper Mag. Can. 54, no. 3: 220-4 (Convention, 1953).

The author describes the fundamental principle of the beta-ray gage and the basic design features of an industrial instrument. The principal components of such a gage—the radioactive source, the detector, and the electronics—are analyzed with respect to their effect on the measurement and their effect on industrial performance. The limit of accuracy of such a gage is examined. The effects of temperature, paper speed, moisture content, light and heavy ridges across the web, and the chemical content of the sheet are considered. The effect of vertical motion of the sheet in the source-detector gap and geometrical design to minimize measurement variations from this cause are discussed. The stability of the gage, methods of standardization and calibration, and the effect of source decay are also examined. Finally, the use of this type of equipment in the paper industry is described, including the measurement and automatic control of basis weight, the control of moisture, profile measurement for variations in weight across the web, and the measurement of the weight of coatings. 4 figures. E.S.

GAVELIN, GUNNAR. Beta-ray meters for paper machines. Svensk Papperstidn. 56, no. 4: 133-4 (Feb. 28, 1953). [In Swedish]

The construction and applications of the Canadian betameter (*cf.* B.I.P.C. 22:938) are discussed. E.S.

WILSON, GEO. E. The betameter in a basis-weight-control application. Pulp Paper Mag. Can. 54, no. 3: 225-9 (Convention, 1953).

The instrument which employs radioactive isotopes is described in a control application on a slow-speed Fourdrinier in a range of relatively heavy basis weights. Its effectiveness as a useful new tool is indicated and various aspects of its use are discussed. In the present case the instrument measures the mass of the sheet coming off the wire and automatically adjusts the stock gate as required. 6 figures. E.S.

PHYSICAL TESTING—PAPER—TEARING STRENGTH

Wahlberg, Thomas K. Studies on tearing strength. Part I. The influence of micro-crêping. Svensk Papperstidn. 56, no. 4: 124-30 (Feb. 28, 1953). [In English; German and Swedish summaries]

This paper deals with the effect of paper-machine conditions on the tear factor. When paper is allowed to shrink during drying, it becomes micro-creped; this term was introduced by Steenberg (*cf.* B.I.P.C. 18: 103). The influence of microcreping on tearing strength has been investigated and compared with the stress-strain properties of paper. A close relationship between the extensibility and tearing strength of paper is shown in laboratory experiments, when handmade sheets are subjected to unidirectional stresses both in the dry condition and during the drying period itself. In the drier section of the paper machine the extensibility and tearing strength of the web are influenced by the same factors. These two properties vary in the same manner across the width of the web of the paper machine, with maxima at the edges, as shown by investigations of samples from three different kraft paper machines. The possibility of producing a paper with a high extensibility and tearing strength is discussed. Variations in the tear of the sheet passing through the drier section have been followed by testing samples from different points in the drier, allowing them to dry freely in the air and without tension. A large decrease in both extensibility and tearing strength takes place at about 75% dryness of the web. The possibility of decreasing this drop by suitable adjustments of the draws and felt tension and by special treatment of the drying cylinders with antiadherent materials is discussed. The tests were carried out with the Australian dynamic tear tester according to the Australian standard method published by Cohen and Watson (*cf.* B.I.P.C. 20: 892-3). 1 table, 11 figures, and 8 references. E.S.

PHYSICAL TESTING—PAPER—VAPOR TRANSMISSION

Brubaker, David William, and Kammermeyer, Karl. Apparatus for measuring gas permeability of sheet materials. Anal. Chem. 25, no. 3: 424-6 (March, 1953).

The authors developed a relatively simple and rugged piece of equipment for the rapid and accurate determination of the permeabilities of sheet materials (plastic films, coated cloth or paper, etc.) to various gases. The principle employed is that of measuring the permeated gas rate at conditions of constant temperature and pressure; the apparatus does not require a vacuum seal or precise regulation of the gas flow. Leaks on the high-pressure side of the membrane will cause no error in the permeability determinations; the low-pressure side is essentially at atmospheric pressure, so that the occurrence of errors resulting from leaks is rather remote. Details of the construction of the instrument and the procedure for its use are given. The tester has been found suitable for both fast and slow films, as well as for studies of flow through pinholes. Typical permeability data obtained are included. 2 tables, 3 figures, and 8 references. E.S.

PHYSICAL TESTING—PAPER—WET RUB

Attwood, B. W. A wet rub tester for mineral coated surfaces. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 33, no. 3: 667-78; discussion: 679-81 (December, 1953).

The development of an empirical wet-rub tester and procedure for mineral coated paper and boxboard at St. Anne's Board Mills, England is described, which converts the finger test into an objective one. A turntable rotated by a

belt drive carries an aluminum dish in which the sample to be tested is secured. A pad of pencil-eraser rubber attached to an arm rests on the sheet being tested at a fixed and controllable pressure (250 g.). A fixed volume (40 ml.) of water at 65-70°F. is poured over the sample and the motor started. The rubber pad is lowered onto the sheet and allowed to rub over the surface of the sample for 30 seconds; the water from the dish carrying the removed coating in the form of a suspension is collected and matched by eye (or photoelectric, nephelometric, etc. means) with a dilution of a standard coating slip. A set of three samples is tested after which the rubber pad is resurfaced. This procedure, including the regrinding, requires about 12 minutes. The correlation with the finger test was found satisfactory. An improved model has just been completed and is coming into use. 5 tables, 8 figures, and 2 references. E.S.

PHYSICAL TESTING—PAPER—WET STRENGTH

MUIR, D. T. G. Experiments with a wet web strength tester. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 33, no. 3: 557-66 (December, 1952); World's Paper Trade Rev. 138, no. 25: 1911-12 (Dec. 18, 1952). [Abridgment]

The Brecht wet-web strength tester was used to study the effect on the strength of the wet web of such variables as moisture content, basis weight, and age of the stuff. These results were used to determine the effect of increased rate of loading and shock loadings on the wet web. The influence of chemical wood-pulp additions to the furnish was also determined, as well as the effect of clay additions to a mechanical/sulfite furnish. The results are given in graphs. 14 figures. E.S.

PHYSICAL TESTING—PULP—CONSISTENCY

S. A new testing apparatus for pulps. Wochbl. Papierfabr. 80, no. 20: 742 (Oct. 31, 1952). [In German]

A tester (I) for the rapid determination of pulp consistency in the range of 0.1 to 50% during the different manufacturing processes (beaters, refiners, bleachers, paper machines, wet presses, etc.) is described briefly. (I) is manufactured by the Spanish firm Carlos Schlarb in San Sebastian; its operating principle is based upon the removal of the water contained in the pulp under an accurately preset pressure. As soon as this required pressure is reached, the fact is indicated by the flashing of a light. A table which is included in the outfit shows the pulp consistency corresponding to this pressure. Results can be obtained in approximately three minutes, so that immediate corrections to the machinery can be applied. 1 illustration. E.S.

PHYSICAL TESTING—PULP—DISINTEGRATOR

BARKAS, W. W., and MINSHALL, H. A sound insulating mount for the B.P.&B.M.A. pulp disintegrator. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 33, no. 3: 682-3 (December, 1952).

The effective damping of mechanical vibrations with spiral springs and rubber balls inserted between the mounting board and base, and the construction of a thin casing (wooden framework lined with fiberboard) to be placed over the instrument for impeding the travel of sound waves at the Paper Section Laboratories of the Manchester College of Technology are described. 2 figures. E.S.

PHYSICAL TESTING—PULP—FREENESS

CHRISTENSEN, G. N., and BARKAS, W. W. Physical properties of paper pulps. Elastic properties of wet mats of papermaking fibres. Nature 171, no. 4343: 165-6 (Jan. 24, 1953).

The authors drained fiber suspensions onto a sintered glass plate to form wet fiber pads 1 cm. in diameter and 1.5 cm. high. The pressure below the plate was varied from zero to 20 cm. of mercury below atmospheric pressure, and the moisture content and volume of the pad were measured as a function of this pressure difference. The pressure differences, or tensions, are related thermodynamically to the equilibrium relative humidities. Data are given for an unbeaten commercial kraft pulp. The volume changes, in this case height changes, are expressed as strains (changes in height divided by original height) and plotted as a function of equilibrium relative humidity. 2 figures and 3 references. G.R.S.

HALLAN, R., and BARKAS, W. W. Physical properties of paper pulps. 'Freeness' of paper pulps and the forces of capillary water retention. Nature 171, no. 4343: 166-7 (Jan. 24, 1953).

The authors drained fiber suspensions onto a sintered glass plate to form wet fiber pads. The pressure below the plate was varied from zero to 20 cm. of mercury below atmospheric pressure and the moisture content of the pad measured as a function of this pressure difference or tension. Pad moisture content is plotted as a function or tension for an easy bleaching kraft pulp beaten for various times in a Lampén mill. The curves for the beaten pulps show displacements from the curve for the unbeaten pulp which is progressively greater as beating time increases. The moisture content at an arbitrarily selected tension of 14 cm. of mercury shows general correlation with Canadian freeness. 2 figures, and 8 references. G.R.S.

PIGMENTS

ANDERSON, W. B. Titanium pigments. Paper Trade J. 136, no. 8: 158-60 (Feb. 20, 1953).

The increasing application of titanium dioxide pigments to many types of paper and board is discussed; new manufacturing facilities added by Titanium Pigment Corp. have dispelled any uncertainty of supply to meet the growing demand. 1 illustration. E.S.

PILOT PLANTS

KOTTE [HANS] The significance of pilot-plant experiments in the paper industry. Allgem. Papier-Rundschau no. 5: 197-200 (March 5, 1953). [In German]

The results of laboratory experiments can very often not be directly applied to mill operation; for filling the gap between laboratory and mill scale, the possibilities of trials in pilot plants are discussed. Examples of two experimental beaters, experimental paper machines, a British coating and impregnating machine developed by T. H. Dixon & Co. Ltd., and an experimental calender constructed by the Appleton Machine Co. are listed. With reference to experimental paper machines and the one installed in the Swedish Forest Products Laboratory in particular, the fact is evident, that the larger the unit, the more expensive the trials will be, so that its use will be considered only in exceptional cases. 12 figures and 2 references. E.S.

PLASTICS

ENGEL, KURT. Pulp and paper as a basis for plastics. Wochbl. Papierfabr. 80, no. 22: 812-14 (Nov. 30, 1952). [In German]

With reference to the exhibits in the German plastics show in Düsseldorf in 1952, the increasing application of paper-base plastics and the use of plastics in paper-converting processes as adhesives, laminating and wet-strengthening agents, and similar attempts are described. E.S.

PULP AND PAPER—IMPURITIES

LOOMER, JOSEPH T. Factors in the design of a stock-cleaning system for a folding box mill. Tappi 36, no. 3: 138-9A (March, 1953).

The author classifies the objectionable material in waste-paper stock into odorous (I) and staining (II) material, light dirt or floaters (III), and heavy dirt (IV). In the case of (I) and (II), preinspection is at present the only safeguard. For the removal of (III) and (IV), different types of equipment (pulpers, Vortraps, Dirtecs, Hydrofuges, screens, and magnets) are employed and their efficiencies are discussed. 1 table. E.S.

PURIFIED WOOD FIBER

LEUGERING, HANS-JOACHIM. A study of pulp purification by hot alkali treatment. Das Papier 7, no. 3/4: 47-51 (February, 1953). [In German; English and French summaries]

Following a brief review of the pertinent literature and a short discussion of the physicochemical differences between the results obtained by cold and hot alkaline pulp purification, the increase in alpha number (cold alkali solubility) (I) of hot purified beech and spruce sulfite pulps was investigated as a function of liquor concentration, pulp consistency, temperature, and copper number. The results are presented in formulas. With increases in (I) of 4-5%, beech and spruce pulps showed a similar behavior; with a more intensive purification, the ratio of beech pulp losses/increase in (I) was always greater. This ratio was found to amount to almost 3 and to be independent of temperature, consistency, and copper number; the latter, however, determines the rate of the reaction. Previous investigators have determined that cellulose molecules in which carbonyl groups are present are split by hot alkali solutions. The present experimental results are explained by the irregular distribution of the carbonyl groups throughout the cross section of the fiber—i.e., by a concentration of the carbonyl groups in the outer portions, which are therefore more readily attacked and degraded. 6 figures and 7 references. E.S.

SIMMONDS, F. A., KINGSBURY, R. M., MARTIN, J. S., and KELLER, E. L. Purified hardwood pulps for chemical conversion. I. Aspen sulphite and prehydrolysis-sulphate pulps. Tappi 36, no. 3: 103-10 (March, 1953).

Purified aspen pulps suitable for chemical conversion were made at the Forest Products Laboratory by the ammonia-base sulfite process, using a liquor relatively low in combined sulfur dioxide, and by the prehydrolysis-sulfate process, using only a water hydrolysis. The purification involved chlorination, hot or cold alkaline extraction, and treatment with sodium hypochlorite and chlorine dioxide. The sulfite pulp, obtained in a yield of 51%, had an α-cellulose content of 87%, a pentosan content of 5.1% and a viscosity of 37.4 centipoises when dispersed at 0.5% concentration in cuprieth-

ylenediamine. The yield of pulp purified by hot extraction was 37.7%; α-cellulose content, 94.4%; pentosan content, 1.5%; and viscosity, 30 centipoises. The yield of pulp purified by cold extraction was 44.4%; α-cellulose content, 96.3%; pentosan content, 0.3%; and viscosity, 22 centipoises. The prehydrolysis-sulfate pulp obtained in a yield of 42%, had an α-cellulose content of 92%, a pentosan content of 2.8%, and a viscosity of 37.6 centipoises. The yield of pulp purified by cold alkaline extraction and treatment with chlorine dioxide was 38.2%; α-cellulose content, 97.3%; pentosan content, 2%; and viscosity, 18.4 centipoises. For pulp purified by hot extraction and treatment with sodium hypochlorite the yield was 37.6%; α-cellulose content, 94.7%; pentosan content, 2.2%; and viscosity, 12.5 centipoises. The yield of pulp purified by hot extraction and treatment with chlorine dioxide was 37.7%; α-cellulose content, 95.5%; pentosan content, 2.5%; and viscosity, 16.3 centipoises. At an industrial laboratory, the two purified sulfite pulps and the two sulfate pulps purified by hot alkaline extraction were acetylated satisfactorily and made into yarn. The experimental cellulose acetate yarns obtained were as strong as yarn made from a commercial softwood sulfite pulp of acetylation grade. 5 tables and 18 references. E.S.

PYRITES

BROMAN, LENNART. The roasting of pyrites in the Nichols-Freeman furnace. Paper and Timber (Finland) 35, no. 2: 40-3 (February, 1953). [In Swedish; English summary] *cf.* B.I.P.C. 22: 688.

Essentially the same information as in the previous article is presented. 2 tables and 2 figures. E.S.

RADIOACTIVITY

NUSPLIGER, E. S. To combat radio-active water caused by atom bomb explosions. Paper Trade J. 136, no. 7: 20-1 (Feb. 13, 1953).

The construction of a water-treatment plant of the J. P. Lewis Co. on the Beaver River and the use of the treated water in the manufacture of board for packaging x-ray films are described. The effectiveness of the installation after atomic-bomb tests has been proved several times. 3 figures. E.S.

RAGS

LIPPMAN, S. IRVING. Cotton rags in '52. Paper Trade J. 136, no. 8: 146, 148 (Feb. 20, 1953); *cf.* B.I.P.C. 22: 520.

The cotton rag and cutting industry, has had a most unusual year in 1952 and experienced a decrease in demand, with the exception of the better grades. The reason for the very light demand in the cheaper, colored, large-quantity grades lies in the fact that the fine paper mills have definitely increased their use of cotton linters and linters pulp; this substitution has been brought about by a drastic change in price. In 1951, the writing-paper industry used about 13% of linters or linter pulp, when the price ranged from 9.5 to 23.5 cents per pound; in 1952, about 20% of linters and linter pulp was employed at a price ranging from 6.65 to 11.25 cents per pound. With a short linter crop and an increasing price level, the demand for many grades of colored rag stocks is bound to increase. E.S.

RAW MATERIALS

EVEREST, D. C. Raw material supply situation. Paper Trade J. 136, no. 8: 82-3 (Feb. 20, 1953); Paper Mill News 76, no. 8: 90

(Feb. 21, 1953); Southern Pulp Paper Manuf. 16, no. 3: 82, 84, 108, 111 (March, 1953); Paper Ind. 34, no. 12: 1471-3 (March, 1953).

The probable availability of raw materials of interest to the pulp and paper industry during 1953 is reviewed. E.S.

JONES, NARD. Man's great search. Am. Forests 59, no. 3: 17-18, 40, 43 (March, 1953).

Starting with the efforts of Ts'ai Lun, China, 105 A.D., the author traces man's search for a suitable, inexpensive, and plentiful papermaking fiber. The search in the United States ended when soda pulp of wood was introduced in 1855, and the use of wood fiber for papermaking was assumed on a commercial scale. L.C.

RAYON—STATISTICS

TEXTILE OR'GANON. Cellulose consumption. Textile Or'ganon 24, no. 3: 38-40 (March, 1953); *cf.* B.I.P.C. 22: 607.

Cellulose consumption by the rayon and acetate industries fell off by 11% to 549,500 short tons from the 1951 record high figure; both dissolving wood pulp (I) and cotton linters (II) consumption was lower than in 1951. However, whereas the decline in (II) amounted to 36%, that of (I) was only 6%, so that (I) consumption was second only to 1951, whereas (II) use was the lowest since 1943. (I) represented 87% of all cellulose consumed in the viscose and cupra production and 93% in the acetate production. The new supply of (I) (U. S. production plus imports minus exports) amounted to 864,655 short tons in 1952, an increase of 6% over the 1951 figure, 56% of which was consumed by the rayon and acetate producers. The same industries consumed approximately 41% of the total U. S. production of purified linters pulp during this period. 1 table and 1 diagram. E.S.

RESEARCH

THIESMEYER, LINCOLN R. Forestry goes into the insurance business. Pulp Paper Mag. Can. 54, no. 2: 49-52 (February, 1953); Fibre Containers 38, no. 3: 107-8 (March, 1953). [Abridgment]

The author presents a discussion in dialogue form on the need for forestry research as applied to the development of wood-harvesting machinery, improved silvicultural methods, chemical pulping, and hardwood utilization. Investment in such research is the only insurance of continued security and expansion for the wood-producing and wood-using industries. L.C.

SAFETY

CLOUTIER, J. M. Water transportation. Pulp Paper Mag. Can. 54, no. 2: 114, 118-19 (February, 1953).

The author cites an alarming increase in drowning fatalities among forest workmen and cautions against employing nervous operators, overloading, permitting smoking in gasoline-driven boats, and using wooden-hull boats when ice is forming. He recommends strict overseeing of water operations, the wearing of life preservers, lining down dangerous rapids, towing a life boat when transporting men, and carrying fire extinguishers. Several serious water accidents are described. L.C.

SEMI-CHEMICAL PULPING PROCESS

KOLLER, A. Pulping methods for the production of semichemical pulps. Wochbl. Papierfabr. 80, no. 20: 739-41 (Oct. 31, 1952). [In German] *cf.* B.I.P.C. 22: 854.

This is a condensed report based on the article by C. W. Converse. 2 tables. E.S.

SAPP, J. E. The manufacture of semichemical pulps. Wochbl. Papierfabr. 23, no. 80: 872, 874, 876-7 (Dec. 15, 1952). [In German] *cf.* B.I.P.C. 22: 854-5.

This is essentially a condensed translation of the original article, including the 4 flowsheets. The translator has appended a bibliography of 76 references. E.S.

SILVER, F. P., and BEATH, L. R. Development of 65 per cent yield sulphite for newsprint furnish. Pulp Paper Mag. Can. 54, no. 3: 215-19, 224 (Convention, 1953).

Rising wood costs increasingly emphasize the importance of higher yields in chemical pulps. A mill-scale pilot plant with a Curlator as the key unit of the refining system which has produced news-grade sulfite pulp of 63-65% yield for nearly three years is described, together with operating conditions and results. Extensive commercial tests proved that the pulp was entirely satisfactory for newsprint furnish, and that newsprint made with it is fully equal to that made with normal-yield sulfite. A brief description is given of the plant at the Riverbend mill of Price Brothers & Co. now under construction to provide full sulfite requirements as high-yield sulfite for the manufacture of over 700 tons of newsprint per day. 1 table, 5 figures, and 2 references. E.S.

WALL, T. P. Instrumentation of the Bathurst BCM process. Pulp Paper Mag. Can. 54, no. 2: 64-6 (February, 1953); *cf.* B.I.P.C. 21: 802.

Following a brief description of the cooking process of the Bathurst twin semichemical continuous pulping unit, the instrumentation of the Chemi-pulper is discussed. 2 figures. E.S.

SHIPPING CONTAINERS

ANON. Class stamping of shipping containers (solid fiber and corrugated). Papier, carton et cellulose 1, no. 3: 62-4 (July-August, 1952). [In French]

The specifications of the French national railroads are given with which solid fiber and corrugated containers must comply before they are permitted to carry the class stamp; this permission may be withdrawn at any time if control tests by the railroads show that the containers are not up to the standard requirements. 1 table and 2 figures. E.S.

ANON. Putting a ton of flour into corrugated container. Packaging Parade 21, no. 242: 130-2 (March, 1953).

Fisher Flouring Mills Co., Seattle, Wash. and Container Corporation of America have developed a corrugated and wood shipping container which holds a ton of flour. The "Bulk-Pak-Bin" minimizes handling for the mill and the wholesale baker and is collapsible for return and re-use. The box consists of a tube of 275-pound test, single-wall, B-flute corrugated board and a top and bottom cap; it is supported by wood members over which steel strapping is applied. The bin is lined with odorless, tasteless jute or kraft. The methods of filling, unloading, and carload handling of this container are described. 13 illustrations. L.C.

LAUTH, J.-P. The expansion in the use of fiberboard shipping containers in France. Papier, carton et cellulose 1, no. 3: 52-5 (July-August, 1952). [In French]

The author discusses the reasons for the slow development of the fiberboard shipping container in France and possibilities where it might be employed, with frequent reference to American practices and applications. 9 illustrations. E.S.

LAUTH, J.-P. The role of the fiberboard container in the French national economy. Papier, carton et cellulose 1, no. 3: 37-40 (July-August, 1952). [In French]

The advantages of fiberboard shipping containers and their increasing use in France are discussed; the per capita consumption is at present about 2.5 kg. Production statistics are included. 6 tables and 5 illustrations. E.S.

SHIPPING CONTAINERS—LOSS AND DAMAGE CLAIMS

ANON. Transportation and packing survey. Fibre Containers 38, no. 2: 73-4, 81 (February, 1953); *cf.* B.I.P.C. 22: 771.

An analysis of the final report on the three-year Transportation and Packing Survey by the Fibre Box Association and the railroads of the United States is presented. The data revealed that 27% of the claims were found to be due to poor handling of cars in transit for which the railroads would be responsible; 34.4% were due to poor arrangement (18.6%) and to shift in load (15.8%) caused by loose loading for which shippers were responsible, and 38.6% to all other causes. These included the 5.8% which were jointly determined to be due to boxes and interior packing found to be inadequate. Certain shippers of any commodity contributed much more to damage claims than did other shippers of the same commodity. The establishment of a new department in the Loss and Damage Prevention Section of the Association of American Railroads is recommended to work with those shippers where assistance is most needed. In addition, the need for improvement in Rule 41 specifications is pointed out and the hope expressed that box manufacturers and the railroads will co-operate in a program to bring about a more realistic Rule 41. The facts revealed in the last report were only slightly different from those contained in the preceding progress report. E.S.

SHIPPING CONTAINERS—TESTING

ANON. General Mills' control of box quality. Fibre Containers 38, no. 2: 76, 81 (February, 1953).

An outline of the testing program for fiber boxes at the control packaging laboratory of the company at Minneapolis is given. Samples from each shipment are checked for size and compared with specifications. Mullen, caliper, and compression tests are made, and fabrication is examined, including joints, crushed fluting, poor liner adhesion, color of printing inks, etc. The data obtained from this program are recorded on special graphs and, by statistical methods, control limits are calculated. These graphs are available to the General Mills' purchasing department and are used by the department in discussions with suppliers. The general objective of this program is the recognition of limitations and the establishment of standards and controls to stay reasonably within the practical limitations. 2 illustrations. E.S.

COON, KENNETH C. Package hygrometers. Modern Packaging 26, no. 7: 119-20, 177 (March, 1953).

Two types of portable electric hygrometers have been developed and tested for use in determining the moisture conditions existing within small low-cost packages or enclosures where conventional instrumentation techniques are impractical. A small, dual-passage probe is used to pierce the container and project it into the enclosed air space. A continuously flowing air sample is withdrawn from the package by a small centrifugal blower. The air sample passes from the probe passage into the measuring chamber, through the blower housing, and is returned to the package through a second probe passage. The sensing elements employed are a thermistor for obtaining temperature measurements and Dunmore-type, humidity-sensing elements for humidity measurements. The power supply and indicating dials are included in a separate portable case. The two hygrometers differ as to the number of humidity-sensing elements they employ; one type has eight elements, and the other one. The multiple-element instrument has an accuracy of 3% when the air space to be tested exceeds 500 cc.; the single-element device is effective for testing air volumes as small as 250 cc. The latter is intended principally for laboratory work. The instruments are described in detail, and calibration procedures and maintenance are discussed. 4 figures and 2 references. L.C.

DEMOY, J. Container testing laboratories. Papier, carton et cellulose 1, no. 3: 56-9 (July-August, 1952). [In French]

The author discusses the purpose of independent container-testing laboratories installed in different countries by different interests, the benefits derived from their services by manufacturer, shipper, consumer, and insurance companies, the equipment generally found in these laboratories, and the urgent need for improved facilities in France. 6 illustrations. E.S.

KELLICUTT, K. Q., LANDT, E. F., and SETTERSHOLM, V. C. Box-strength calculator. Modern Packaging 26, no. 7: 121-3, 178-9 (March, 1953); Fibre Containers 38, no. 2: 82-6 (February, 1953); *cf.* B.I.P.C. 23: 126.

To provide design criteria for the manufacture of shipping containers based on the physical properties and strength characteristics of the board, an investigation of the basic properties of fiberboard and its component paperboard sheets was initiated at the Forest Products Laboratory. To simplify the use of the formulas developed for predicting some of the properties, alignment charts were constructed (*cf.* B.I.P.C. 22: 357); a further simplification of the design criteria resulted in the development of the box-strength calculator (I). It consists of a hairline indicator and five circular disks with various scales (disk no. 1: moisture adjustment and duration-of-load scale; no. 2: box-factor and box-perimeter scale; no. 3: component crushing-strength index and box perimeter scale; no. 4: scale for combined crushing strength of components and board index; and no. 5: index setting for solid-fiber boxes in which the load is applied parallel and perpendicular to the machine direction, as well as A-, B-, and C-flute corrugated boxes, and the scale for compressive strength of boxes). The relationships upon which (I) is based are discussed, and its application to the solution of design problems for corrugated and solid fiberboard boxes is described, including examples. 1 figure and 7 references. E.S.

PARIS, PAUL. A strength comparison of two leatherboards. Allgem. Papier-Rundschau no. 5: 202-3 (March 5, 1953). [In German]

In a study of the relationship of the performance of folding boxes made from two different leatherboards (as evaluated from revolving-drum and compressive-strength data) and the tear and bursting strength of the component boards, no definite connection between the two could be established. Experiments with an impact-strength tester and a stiffness tester (both developed by the author) permitted the correct evaluation of the two boards; however, the results were again not in agreement with the performance of the boxes made from these boards. It does not seem correct that any of the above tests should be used as a criterion for box performance. 1 table and 3 figures. E.S.

SODA ASH

CHEMICAL ENGINEERING. Soda ash is and will be ample. Chem. Eng. 60, no. 3: 193 (March, 1953).

Supply and demand of soda ash have been delicately balanced for some years. The start-up of a new plant by Westvaco Chemical Division at Westvaco, Wyo. with its 300,000-ton capacity will stabilize the picture and take care of foreseeable future demands. The old conventional picture of soda ash consumption will change in the future; downward trends are expected to continue for caustic, soap, and water softening, but other industries with upward trends will take the surplus. 1 table. E.S.

SPECIFICATIONS—RULE 41

ANON. U. S. vs. other fibre box specifications. Fibre Containers 38, no. 2: 64, 66, 68, 72 (February, 1953).

The provisions of the English, Canadian, and Mexican freight classifications are discussed and compared with those of Rule 41 of the Consolidated or Uniform Freight Classifications. 2 tables. E.S.

SPENT SEMICHEMICAL LIQUOR

OPFERKUCH, ROBERT E. Semi-chemical pulping waste treatment. Paper Trade J. 136, no. 9: 26-7 (Feb. 27, 1953); Chem. Eng. 59, no. 12: 270 (December, 1952). [Abstract]

The author reviews the advantages and disadvantages of semichemical over "fully chemical" cooks, with particular reference to the characteristics of the spent pulping liquors from the semichemical neutral sulfite process (I). Chemical and oxidation methods of treatment of (I) tried at the Virginia Polytechnic Institute are described; the development of a chemical recovery system is considered feasible. Three methods of concentrating (I) to a point where they will burn are being investigated: submerged combustion evaporation (II), vapor compression evaporation (III), and selective solvent concentration (IV). Although the operating cost of (I) is somewhat higher than multiple-effect evaporation, the capital costs are less and operation is considerably easier. (IV) with acetone, the best solvent found to date, is far too expensive and complicated in operation to compare with multiple-effect evaporation or (II). The work on (III) is still in the early stages and cannot be evaluated at present. E.S.

STAINS AND STAINING

FIEDLER, HEINZ. The use of p,p′-azodimethylaniline for fiber analysis. Wochbl. Papierfabr. 81, no. 2: 47 (Jan. 31, 1953). [In German] *cf.* B.I.P.C. 22: 857-8.

Following a brief description of the work by Green and Yorston on the use of *p,p′*-azodimethylaniline (I) as a selective stain for unbleached sulfite

fibers, the author confirms the favorable results obtained with the reagent. (I) forms a stable solution which can be directly applied without involving cooking or any other preliminary treatment of the specimen under investigation. It can also be used for macroscopic studies by applying a few drops to a paper sheet, allowing it to react for a certain length of time, and removing the excess. If, for instance, a bleached kraft paper contains an admixture of unbleached sulfite, the spot will show a reddish tinge with a darker border; even with unbleached kraft a differentiation is possible in spite of the brown color of the paper. When no unbleached sulfite is present, the spot remains colorless. 1 reference. E.S.

STARCH

FOSTER, JOSEPH F., and PASCHALL, EUGENE F. Effect of disaggregation of amylose on the properties of the iodine complex. J. Am. Chem. Soc. 75, no. 5: 1181-3 (March 5, 1953); *cf.* B.I.P.C. 22: 943-4.

Corn amylose was separated into four sub-fractions by crystallization from 15% aqueous pyridine. Light-scattering studies indicated that all fractions were highly aggregated in aqueous solution. Disaggregation by aging in neutral aqueous solution resulted in a decrease in iodine-binding affinity and a decrease in the wavelength of maximum absorption of the iodine complex in all cases. In the case of the most highly aggregated sample the binding capacity was markedly increased. Some implications of these observations in terms of the nature of the amylose aggregates and the mechanism of iodine binding are discussed. 6 figures and 11 references. E.S.

PASCHALL, EUGENE, F., and FOSTER, JOSEPH F. Some factors which influence the iodine affinity of amylose as shown by potentiometric titration. J. Am. Chem. Soc. 75, no. 5: 1177-80 (March 5, 1953).

The effects of certain experimental variables on the iodine-titration behavior of several amylose preparations are investigated. Results obtained clearly do not represent an equilibrium state but reflect the previous history of the amylose preparations. Of particular importance are the time of aging of the alkaline solution prior to neutralization, and the time of aging and pH of the solution following neutralization. The affinity of amylose for iodine is enhanced by pretreatment with iodine. An attempt is made to interpret the results in terms of the state of aggregation of the amylose molecules. 7 figures and 7 references. E.S.

STATIC ELECTRICITY IN PAPER

RESEARCH AND ENGINEERING COUNCIL OF THE GRAPHIC ARTS INDUSTRY, INC. Static electricity in paper handling. Paper series no. 1. Washington, Printing Industry of America, c1951. 17 p.; Allgem. Papier-Rundschau no. 1: 18-20 (Jan. 12, 1953). [Abridgment] [In English and German]

Troubles caused by static electricity, its nature and generation, apparatus and methods of elimination, methods of measuring static electricity, unexplained effects of static in paper, and radioactive static eliminators are reviewed. 1 diagram and 22 references. E.S.

STEAM POWER

ANDRITZKY, M. Determination of the most favorable steam generation for a paper mill under a given set of conditions. Wochbl. Papierfabr. 81, no. 3: 79-81 (Feb. 15, 1953). [In German]

The expansion program of a large paper mill requires additional steam- and power-generating capacity. Calculations are presented for determining the most economical operating conditions of a new steam power plant for the setup of this particular mill in Germany. 2 tables and 2 diagrams. E.S.

DE LORENZI, OTTO. Turbulent suspension burning as applied to steam generating units for paper mills. Tappi 36, no. 3: 97-102 (March, 1953).

During the semiannual meeting of the American Society of Mechanical Engineers at San Francisco in June, 1949, preliminary development work and test results on single-stage furnaces for burning wet wood were discussed. The design, employing the principle of suspension burning, has now been refined. At present several units are in various stages of construction, whereas an additional one has been in continuous service for a period of over 20 months. Considerable operating data, covering a wide range in capacity when burning wet woodroom refuse, fuel oil, and high as well as low-volatile coals, are now available. The effectiveness of this method for firing solid fuels is reflected in the performance obtainable at apparent heat-liberation rates which exceed those normally accepted as standard. A motion picture of actual furnace-operating conditions shows the effective flash drying and devolatilization obtained through use of suspension burning in a highly turbulent furnace operation. 1 table, 8 figures, and 3 references. E.S.

KARPINSKI, J. A comparison of costs with combined power and heat generation, separate generation, and variable exhaust-steam pressure. Allgem. Papier-Rundschau no. 4: 166-9; no. 5: 205-7 (Feb. 26, March 5, 1953). [In German]

A graphic method is described for plotting all cost-influencing factors and their relationships in a comprehensive diagram, so that the resulting costs for separate or combined power and heat generation can be determined at a glance and with considerable accuracy. A simple cost estimate for variable bled steam pressures also becomes possible. 2 diagrams. E.S.

STRAW

A. J. Variations on an ancient theme. Papeterie 75, no. 1: 3, 5, 7 (January, 1953). [In French]

The possibilities of straw pulp are recapitulated and supplemented by tabular data. The entire issue of *Papeterie* is printed upon paper containing 75% bleached straw pulp, and two sample sheets with 62 and 50%, respectively, of bleached straw pulp are included. 5 tables. E.S.

HEBBS, LEWIS G. Cereal straw pulping in the United Kingdom. Tappi 36, no. 3: 148-50A (March, 1953); Paper-Maker (London) 125, no. 3: 201-4 (March, 1953); Tropical Woods and Agricultural Residues as Sources of Pulp; a symposium. FAO Forestry and Forest Products Studies no. 3: 155-61 (December, 1952).

The author describes the British wartime experience with straw pulping

in small plants built to handle esparto and the almost complete reversion to esparto grass, as soon as supplies became available again after the cessation of hostilities. Although satisfactory pulps can be produced from cereal straw by the soda process and alkali or neutral sodium sulfite semichemical processes, the pulps have certain characteristics which make them less desirable than those which they are supposed to replace. Economical considerations, uncertain supplies, and problems of plant location and waste disposal are further deterrents in the application of cereal straw to papermaking. 6 tables. E.S.

MANDRIN, R. Straw pulp and paper. Papier, carton et cellulose 1, no. 3: 41-4 (July-August, 1952). [In French]

The two most generally employed processes for the manufacture of straw pulp in France are the cold maceration with lime and the cooking in rotary digesters with lime under pressure. Reference is also made to a new continuous cooking process, preferably with caustic, the Huguenot process, a Spanish development, which produces semichemical pulps for the manufacture of corrugated board. The possibilities of a French straw-pulp industry are emphasized. 1 table and 4 figures. E.S.

TABB, C. B. Modern manufacture of straw pulp. Papeterie 75, no. 1: 17, 19, 21, 23-5 (January, 1953). [In French] *cf.* B.I.P.C. 23: 50-1, 205.

Essentially the same information as in the previous articles is given, although the arrangement is somewhat different. 9 tables. E.S.

STREAM POLLUTION

GEHM, H. W. Present practice in treating papermaking effluent. Paper Trade J. 136, no. 9: 22-4 (Feb. 27, 1953); Paper Mill News 76, no. 18: 14 (May 2, 1953). [Abridgment]

The author discusses the problem of clarifying paper-machine overflow waters to a point where they can be discharged without deleterious effects to the receiving waters; this is in many cases a problem distinct from the salvage of papermaking materials in that the effluent may require further clarification. The flows in need of such treatment should be segregated and discharged at as uniform a rate and temperature as possible. Clarification of the waste water is generally accomplished by sedimentation because of capital operating cost, ease of operation, and flexibility; flotation and filtration can also be employed with success. The author discusses the different types of sedimentation units under the subdivisions of settling tanks and upflow clarifiers with and without mechanical sludge collectors and the results possible with them. The addition of coagulants will improve the reduction in total suspended solids. The greatest problem and largest operating expense involved in the entire clarification system are generally the dewatering and disposal of the residual sludge. Different solutions are described. 1 table and 2 figures. E.S.

MOGGIO, W. A. Kraft mill wastes research. Paper Trade J. 136, no. 9: 28-31 (Feb. 27, 1953); Paper Mill News 76, no. 18: 13-14 (May 2, 1953). [Abridgment]

The author discusses some of the achievements and work in progress on the kraft-mill waste project at the Louisiana State University. The most significant achievement to date is the development of an accelerated biological process for the treatment of kraft mill effluents. When kraft mill waste, treated by this process, is added to larger volumes of untreated wastes, it greatly stimulates oxidation during lagooning, thereby reducing the detention

period required to stabilize the lagooned waste. However, the new method will find application particularly where storage oxidation may not be feasible for various reasons; it will also serve to make available new mill sites which previously had been considered unsuitable from a waste-disposal standpoint. Major emphasis of the kraft-mill wastes project is now directed toward the problem of color removal. Chemical treatment with hydrated lime is under investigation. Difficulties encountered in the one-stage lime treatment have shifted the emphasis to a multiple-stage treatment process. The major problem at present is the recovery of the lime in the first sludge, designated as calcium-organic sludge (I); it is voluminous and gelatinous in character and does not readily lend itself to economical dewatering. Several promising methods for treating (I) to separate the calcium fraction in a recoverable form are under investigation, and are reviewed briefly. 7 figures. E.S.

MURDOCK, HAROLD R. Industrial wastes. Ind. Eng. Chem. 45, no. 3: 102A, 104A, 106A (March, 1953).

By means of a hypothetical example, the author shows the harmful cumulative effect of mistakes in poor community planning, involving the discharge of city sewage, the waste of six medium-size manufacturing plants, and the effluent of a large paper mill into the existing watershed, whereby the natural ability of the river to correct these pollution conditions is entirely destroyed. Full blame for the biological destruction is placed on the paper mill, although the responsibility for the stream contamination rests with all eight sources of pollution. Industries and cities must plan to prevent stream pollution; the first step is to prepare a comprehensive survey of all the assets entering into plant-location matters. The cities themselves must practice sound stream sanitation; industry today is carefully examining such situations and preferring those with adequate installations. Industry, on the other hand, must be willing to take care of its part of the pollution problem. E.S.

SULFITE PROCESS

HÄGGLUND, ERIK. Sulfite cooking with recycling of waste liquor. Das Papier 7, no. 3/4: 41-6 (February, 1953). [In German; English and French summaries] *cf.* B.I.P.C. 22: 695.

Essentially the same information as in the previous reference is presented, with emphasis on the importance of a cooking temperature not exceeding 115-120°C. and the danger of harmful formic acid formation. Additional data on high-yield hardwood pulps (birch, aspen, and beech) prepared with recycled spent liquor are included (*cf.* B.I.P.C. 22: 332). 5 tables, 3 figures, and 7 references. E.S.

SULFITE PROCESS—AMMONIA BASE

HORTON, J. L. Organization and implementation of an ammonia-base mill trial. Pulp Paper Mag. Can. 54, no. 3: 205-9, 214 (Convention, 1953).

Evidence of the widespread interest in ammonia-base sulfite pulping during the postwar years is substantiated by the number of mills that have adopted it on a permanent basis. Others have completed or are contemplating trials with ammonia to study the local factors involved. It is the purpose of the present paper to assist the latter group by pointing out the comparative ease of establishing a trial, with emphasis on the pitfalls encountered and the steps taken to overcome them during such a trial. The author outlines the conversion of a sulfite acid plant from a calcium-base to a temporary ammonia-base system and the operation of ammonia-base pulping on a mill

scale. The factors which influence the application of a soluble base to the cooking of softwoods and hardwoods for tissue-grade papers are considered. It is shown that ammonia can be introduced to a Jenssen two-tower system with little additional equipment and a minimum of rearrangement of existing equipment. The ease of controlling acidmaking with ammonia makes it preferable to calcium-base acidmaking. Indications are that with the use of ammonia in pulping to the same bleach requirements as with calcium, a higher yield results with a decreased temperature and a cooking time shortened by at least one hour. Ammonia-base pulps are equal in quality to calcium-base pulps when cooking softwoods, but are better than calcium-base pulps when cooking hardwoods or a mixture of softwoods and hardwoods. It was found that circulation rates increased with the cleaner system. It was also found that an independent recovery system should be provided for the efficient absorption of the overgas. 5 tables, 5 figures, and 7 references.
E.S.

SULFITE WASTE LIQUOR

AMBERG, HERMAN R. Spent sulphite liquor pollution abatement programs in the Pacific Northwest. Paper Trade J. 136, no. 9: 20-1, 31 (Feb. 27, 1953).

The author discusses methods used in that area under the five headings: road binder, storage lagoons, submarine diffusion lines, soil conditioning, and irrigation. The first three methods have been carried on to actual full-scale installations, which handle the entire mill sulfite waste, whereas the disposal of the spent liquor by irrigation and soil conditioning is still at an experimental stage. Hydrological conditions in the Northwest are such that a pollution problem exists, at most, for approximately 120 days during the summer and early fall; the remainder of the year stream flow is sufficient to supply adequate dilution. Considerable progress in decreasing sulfite pollution has been made, although no general solution to the problem has yet been found.
E.S.

SCHOEDLER, K. Utilization of spent sulfite liquor by acetone-butanol fermentation with butyl bacteria. Wochbl. Papierfabr. 81, no. 2: 44-6 (Jan. 31, 1953). [In German]

The author emphasizes the advantages of acetone-butanol fermentation (I) of spent sulfite liquor, particularly where beechwood liquors are available which contain principally pentoses and cannot be fermented to alcohol with yeast. Data from pilot-plant studies at Tornesch are included from which the economics of the process for a German pulp mill with an annual production of 40-50,000 tons (half coniferous and half beechwood) are calculated and compared with the results of yeast fermentation of the coniferous spent liquor alone. The result is very much in favor of (I). In addition, butanol and acetone are in much better demand than sulfite alcohol, the price of which has dropped considerably since alcohol from molasses has again become plentiful. 1 table and 1 diagram.
E.S.

SIMMONS, TORSTEN. The Loddby cyclon burner; a new way of burning waste sulfite liquor. Svensk Papperstidn. 56, no. 4: 121-3 (Feb. 28, 1953). [In English]

The development of a cyclone burner for the firing of spent sulfite liquor at the Loddby mill of Holmens Bruks & Fabrik AB is described. The burner involves a normal boiler type with water-cooled furnace walls suitable also for the firing of other fuels and special combustion chambers for the spent liquor outside the furnace proper. The liquor is fed under pressure through atomizers into a cylindrical, brick-lined muffle with the atomizer at one end

of the cylinder. Air intakes along the greater part of the muffle force the liquor drops sprayed in the form of a hollow cone toward the circumference where the concentration of oxygen is highest and conditions for burning are most favorable. Drying and ignition take place outside the furnace. The liquor particles, whenever they strike the walls, must be so dry that they will not stick. The ash has been allowed to pass with the flue gases into and through the furnace. Most of it goes with the flue gases to the dust collectors, from where it is shovelled away every Sunday, mixed with water to form a slurry, and pumped away. No difficulty should be experienced in a boiler fitted with soot blowers. The ash is pure white and contains no organic matter. When the wood is transported by land, the ash shows no tendency to cake; wood floated to the mill in salt water will give an ash with a certain tendency to cake to the tubes. However, the deposits are very brittle and easily dislodged by light tapping. The operation of the first units at Loddby was so successful that a new boiler is now under construction; it is a La Mont type with a water-cooled sloping grate for firing wood refuse and two cyclone burners for the spent liquor. The patent rights of the invention have been assigned to AB Rosenblads Patenter in Stockholm. Several other Swedish mills have already installed or are in the process of installing the new cyclone burner; some of these are designed to be used in conjunction with oil or coal. 3 figures. E.S.

SULFUR

CHEMICAL ENGINEERING. Sulphur, acid: enough again. Chem. Eng. 60, no. 3: 190-1 (March, 1953).

Temporarily at least, production of sulfur and capacity needs are back in balance. Sources and disposition of sulfur and new technical developments are reviewed briefly. 4 tables. E.S.

SURFACE AREA

KRAUS, GERARD, and ROSS, JOHN W. Surface area by means of gas flow methods. II. Transient state flow in porous media. J. Phys. Chem. 57, no. 3: 334-6 (March, 1953).

Transient-state flow rates in the Knudsen flow region have been measured on a series of powders previously investigated by steady-state flow methods. Surface areas calculated from the transient flow data using nitrogen were found to agree exceedingly well with nitrogen adsorption areas, even in cases where steady-state measurements yield too small a surface area. Helium flow measurements result in somewhat larger areas, suggesting that more surface is accessible to the smaller helium molecules than is to nitrogen. 1 table, 2 figures, and 10 footnotes. E.S.

KRAUS, GERARD, ROSS, JOHN W., and GIRIFALCO, L. A. Surface area analysis by means of gas flow methods. I. Steady state flow in porous media. J. Phys. Chem. 57, no. 3: 330-3 (March, 1953).

Steady-state flow rates have been measured on packed columns of powders ranging in Brunauer, Emmett, and Teller surface area from 0.30 to 8.0 sq. m./gram. By treating the Poiseuille and Knudsen flow contributions to the total permeability independently, it is possible to calculate two surface areas from the flow data. The experimental evidence suggests that the surface area deduced from the Poiseuille flow contribution represents the geometric area of the particles, whereas the Knudsen flow area is to be identified with the total surface of the continuous pore space. In no case do steady-state flow areas include the surface of blind pores. 2 tables, 7 figures, and 16 footnotes. E.S.

TAILINGS

HORSTMAN, A. J. Low consistency refining of groundwood tailings; a progress report. Pulp Paper Mag. Can. 54, no. 3: 163-5 (Convention, 1953).

Laboratory experiments at the Fiber-Products Laboratory in co-operation with the Mechanical Pulping Committee of the Technical Section of C.P.P.A. on the refining of groundwood tailings in a Bauer disk refiner with several different plate designs at consistencies less than 5% are reported; the usual range of consistencies is from 5-6 to as high as 15%. The runs were made at 3, 4.5, 6, 8, and 12% with horsepower inputs of 30, 40, and 50 h.p. days/ton. No wide differences between pulps refined at low and high consistencies could be established. Refining at 3% produced pulp which under some conditions might be considered slightly superior in Mullen strength to pulps produced at higher consistencies, whereas better tear values are obtained at consistencies of 6-8%. Fiber classification data (obtained with a Bauer-McNett classifier) seem to indicate that fiber length is better preserved at low-consistency refining. The tests are admittedly inconclusive, and a great deal of additional work must be done. 6 figures. E.S.

TANNINS

W.H.S. Trying for tannin. Ind. Eng. Chem. 45, no. 3: 15A, 17A (March, 1953).

Reference is made to efforts for finding additional vegetable tannin sources in the United States, including experiments with canaigre, wattle, hemlock, mangrove, scrub oak, etc; modified lignin extracts and synthetic tanning agents are also listed. E.S.

TESTING, GENERAL

GRIFFIN, ROGER C. Report of Standards Committee for 1952. Tappi 36, no. 3: 90A, 92A (March, 1953); *cf.* B.I.P.C. 22: 531.

The activities of the Committee during 1952 are reviewed, including new and revised standards, changes in Committee personnel, and the problem of keeping old standards up to date. 1 table and 9 references. E.S.

VACUUM PACKAGING

ANON. Vacuumized dills. Modern Packaging 26, no. 7: 78-9, 176 (March, 1953).

The H. J. Heinz Co. has developed a flexible vacuumized dill-pickle package which is a laminated combination of cellophane on the outside and polyethylene on the inside; it is prefabricated with a heat seal on three sides, and the final seal is made after filling and vacuumizing. The two- or one-pickle pouches permit the pulling of a 28-in. vacuum; they are liquid holding, resistant to acidity, and completely taste free. The pouches are boxed in a corrugated shipping container whose cover flaps serve to divide the interior into sections. The packaging procedure is described, and the retail advantages of the transparent printed pouches are cited. 4 illustrations. L.C.

VENTILATION

JORDAN, J. C. Paper mill ventilation with closed hoods at Iroquois Falls. Pulp Paper Mag. Can. 54, no. 3: 253-66 (Convention, 1953).

The installation of closed hoods and auxiliary ventilating equipment on three newsprint machines as part of an expansion program are discussed. Conditions and equipment prior to the new installations are described, and details of the new equipment are given, including the hoods (which are totally enclosed and fabricated from insulated roof panels and corrugated side curtains), and the exhaust, felt-supply, room-supply, Grewin, calender-cooling, wet-end exhaust, trim-conveying, and motor-cooling systems. Tests were made on one paper machine with totally closed hood and with certain panels opened; the improved ventilation of the closed construction permitted an increase in speed and reduced steam consumption and pressure. The installation of economizers made heat recovery from water and air possible which amounted to as much as 50% of the total metered steam to the paper machine. Room conditions have improved, but the full benefit will not be realized until all room-supply air systems have been installed and the three wet-end exhaust fans have been placed in operation. The design for open hoods was unnecessary as is now realized, but at the beginning of the project there was no way of knowing whether or not the closed hoods would be feasible. 10 tables and 13 figures. E.S.

VISCOSITY

THICKENS, R. W. Determination of the rheological properties of fluids by an electronic method. J. Polymer Sci. 10, no. 3: 257-73 (March, 1953). [French and German summaries]

It has long been known that a single-point determination can not describe the rheological properties of a fluid. A new method applicable to nonconducting fluids with viscosities ranging from a few hundred to more than 15,000 poises is described. The method consists of a cup and ball in which the ball is forced into rather than pulled out of the cup. Viscosity is measured electronically as a function of the time required for the ball to move a predetermined distance under a given load. Shear rates are variable over very large ranges. Rheological studies were made of a blown castor oil, three polyisobutylenes, and a high viscosity polystyrene. In addition certain physical properties of polyisobutylenes are presented. 10 tables, 8 figures, and 5 references. E.S.

VOCABULARY, TECHNICAL

H. W. Uniform designations in the paper-box industry. Allgem. Papier-Rundschau no. 24: 1066-72, 1074-5 (Dec. 22, 1952). [In German] *cf.* B.I.P.C. 23: 207.

With reference to the previous article by Kotte and the emphasis on the need for accurate definitions in the paper- and board-converting industry, H. W. presents a condensed summary in tabular form, in which the terms for the different types of boxes, their component parts, special manufacturing procedures, interior decoration and arrangement, and closures are explained, supplemented in most cases by helpful diagrams. E.S.

WASTE HEAT

ANON. Savings on heating water are important savings at paper mill. Chem. Processing 16, no. 3: 20-1 (March, 1953).

A V/A cell-controlled system installed at the New York & Pennsylvania Co. mill at Johnsonburg, Pa. is described which controls and limits the flow of cold water to condensers to the minimum required amount, so that hot water may be recovered for the mill system, charging Hydrapulpers, etc. 1 flowsheet. E.S.

WASTE PAPER

BAKER, COLLEY S. Waste papers provided one-third of the paper and board furnish in 1952. Paper Trade J. 136, no. 8: 152 (Feb. 20, 1953).

Consumption of all grades of waste paper during 1952 amounted in round figures to 7,880,000 tons, of which the paperboard mills took about 5,885,000 tons, the paper mills 1,158,000 tons, the roofing and wallboard mills 744,000 tons, and the wet-machine board mills 93,000 tons; the building-materials group was the only one which increased its waste-paper consumption in 1952 over 1951. It is estimated that of the total tonnage, approximately four million tons consisted of news and mixed grades, 2 million tons of the high grades, and 1,880,000 tons of old corrugated boxes. E.S.

MERLAU, —. The regeneration of waste paper containing bitumen. Wochbl. Papierfabr. 81, no. 2: 43-4 (Jan. 31, 1953). Das Papier 7, no. 3/4: 61-2 (February, 1953). [In German] *cf.* B.I.P.C. 23: 362-3.

Reference is made to the development of a special process by Jayme and co-workers in Darmstadt in co-operation with Voith for the recovery of bituminous waste paper so that no difficulties are encountered in the re-use of this waste. The laboratory experiments were confirmed by mill-scale trials. The process consists essentially of a mechanical treatment in a special Voith breaker beater, followed by a chemical treatment with 3-5% xylene or benzene at 35-40°C. The cost of this treatment is sufficiently low to make the commercial application feasible. Experiments in Darmstadt are continued for developing special combinations of alkalies, dispersing and wetting agents, and solvents so that the cost may be still further reduced. Patent applications for the process have been made. E.S.

WAXES

SAVIDAN, L. Constitution of esparto wax. Bull. soc. chim. France: 320 (March, 1953). [In French]

The raw material for this study was the dust collected from esparto mills; when extracted with trichloroethylene, it gave a hard dark-brown wax, melting at 70-72°C. Various constants were determined. The wax is very high in unsaponifiable matter (over 50%) and appears to contain some volatile acids, including butyric acid. This is a preliminary report; the work is being continued. 1 reference. L.E.W.

WOOD—DECAY

PEARL, WESLEY L. A method for the estimation of decay in Douglas-fir wood chips. Tappi 36, no. 3: 133-6 (March, 1953).

A method with an accuracy within 5-10% for the estimation of the amount and type of decay in Douglas-fir wood chips is described; it is recommended as a control test for the evaluation of the quality of wood chips from a given source or group of sources. The relative amounts of the predominant types of decay (white-pocket rot, brown rot, and dote) are determined by a combination of water, alcohol, and caustic soda extractions of the pulverized wood samples and noting the color and intensity of color of each of the filtrates; the sensitivity of the test can be increased by comparing differences in the spectral transmission curves of the alcohol extracts. Including the time necessary to dry the samples, 36 to 48 hours are required to carry out the test. 3 tables, 1 diagram, and 6 references. E.S.

WOOD—EXTRACTIVES

ANDERSON, ARTHUR B. Pinitol from sugar pine stump wood. Ind. Eng. Chem. 45, no. 3: 593-6 (March, 1953); *cf.* B.I.P.C. 23: 472.

The present investigation was undertaken to evaluate the extractive components in sugar pine stumpwood (I). Surprisingly large quantities of pinitol were found; the average yield was 8.3 to 9.8% or 166 to 196 pounds of product/ton of (I) on a dry basis. The pinitol is readily recovered from the wood by water extraction and subsequent concentration of the aqueous extract. This simple process may make possible the utilization of (I) which is now left in the forest as a logging residue. 5 tables, 2 figures, and 17 references. E.S.

HERGERT, H. L., and KURTH, E. F. The chemical nature of the extractives from white fir bark. Tappi 36, no. 3: 137-44 (March, 1953).

The extractive content of white fir bark ranged from 17 to 22% of the dry weight of the bark. The hexane extractive, a light-brown wax obtained in about a 2.5% yield, was composed of free lignoceryl alcohol and behenic acid, and of combined lignoceryl alcohol, phytosterol, unsaturated alcohols, combined behenic acid, and unsaturated acids. Benzene extraction of the hexane-extracted bark residue produced a dark-brown wax, in about a 1% yield, that was composed of lignoceryl alcohol, phytosterol, behenic acid, 13-hydroxy myristic acid, hexane-insoluble unsaturated acids, and a phenolic acid. By extracting this bark residue with ethyl ether, d-catechin, l-epicatechin, and 3′-methoxy dihydroquercetin were obtained in about a 2% yield. A phlobatannin was obtained in about a 7% yield by hot-water extraction. Alcohol extraction of the solvent- and water-extracted bark residue yielded about 2% phlobaphene. The cork fraction, which comprised roughly 40% of the bark and was easily separable by screening hogged bark, contained 6% wax, 6 to 16% catechin, 5% tannin, and 3 to 7% phlobaphene. 13 tables, 5 figures, and 14 references. E.S.

WOOD DISTILLATION

MORGAN, L. W., ARMSTRONG, G. M., JR., and LEWIS, H. C. Distillation of hardwood in a fluidized bed. Chem. Eng. Progr. 49, no. 2: 98-101 (February, 1953).

Data are reported on the distillation of red oak, milled and screened to a size range from 70 to 200 Tyler mesh, in a fluidized state. The distilling zone was a 4-foot vertical section of standard 2-inch pipe. The distillation temperature was 400°C. Average yield data for 30-minute batch runs, based on the dry charge, showed 32% charcoal, 29% liquid products (less moisture in the charge), and 16% gas. The liquid fraction yielded 5.9% acid, calculated as acetic, and 1.3% methanol, based on the dry charge. The data suggest that the reactions proceed in three stages. First, there is a lag of about three fourths of a minute, probably consumed in preheating. The next four minutes, reaction proceeds rapidly. Finally there is a long period in which reaction continues at a slow and decreasing rate. 2 tables, 7 figures, and 6 references. R.P.W.

WOOD OPERATIONS

VÖRY, JAAKKO. The mechanization of woods operations. Paper & Timber (Finland) 35, no. 2: 51-5 (February, 1953). [In Finnish; English summary]

The author discusses the gradual introduction of mechanized equipment in Finnish woods operations. E.S.

WOOD STORING

CRANDALL, HENRY C. Wood storage problems in the pulp and paper industry. J. Forest Products Research Soc. 3, no. 1: 72-3 (February, 1953); Paper Trade J. 136, no. 17: 26-7 (April 24, 1953).

Deterioration of pulpwood in storage caused by fungi and insects results in measurable losses. The losses caused by fungi in one mill over a 13-month storage period were determined and found to increase wood cost by 18%. The importance of sound woodyard-storage practices is emphasized and directions for such practices are given. 3 figures and 2 references. E.S.

WOOD TRANSPORTATION

WEGELIUS, TH. Bridging the gap between the bush and the mill. Pulp Paper Mag. Can. 54, no. 3: 166-9 (Convention, 1953).

The author emphasizes the need for a closer mutual understanding of the requirements and problems of the forester and pulp- and papermaker with regard to the growing and utilization of wood and discusses methods employed in Finland to obtain better personal contact and co-operation between the two. Reference is made to a joint meeting held between Finnish paper-mill engineers and foresters for this purpose, and the contents of the papers presented are reviewed briefly. Most of them deal with pulpwood quality and storage and transportation problems and have been previously abstracted from the original publications in *Paper and Timber (Finland)*. Speaking as a forester and pulp- and papermaker, the author believes that the growing importance of the transportation problem will justify the training of a special corps of transportation engineers to bridge the gap between the bush and the mill. 3 figures. E.S.

X-RAY RESEARCH

CHAMPETIER, G., and LEGRAND, C. Hydration of the different polymorphic forms of cellulose. J. Polymer Sci. 10, no. 2: 223-7 (February, 1953). [In French; German and English summaries]

X-ray diffraction studies show only variations of intensity when native cellulose (cellulose I) is swollen with water, but the unit cells are changed for cellulose II and cellulose III. The transformations are more marked if the cellulose III is prepared from mercerized cellulose (cellulose II). The stoichiometric ratios cannot be determined from x-ray data. 1 figure and 7 references. K.W., Jr.

YELLOWING OF PAPER

MOHRBERG, W. The yellowing and resistance to aging of paper. Allgem. Papier-Rundschau no. 1: 6-11 (Jan. 12, 1953). [In German]

The author discusses the influence of certain constituents (lignin, fats, waxes, rosin soaps, fillers, oxycellulose, and residual chemicals from cooking or bleaching) and ambient conditions (light, heat, temperature, and atmosphere) upon the yellowing of paper, with reference to the pertinent literature. He describes his own experiments with paper samples with and without mechanical pulps which were exposed to daylight, ultraviolet light, and high temperatures. In all cases an increase in yellowing was noticeable. For the

numerical evaluation of the degree of yellowing a new colorimeter by Agahd was employed; a brief description of the instrument is given. The requirements for stable papers include: absence of unbleached or mechanical pulps, i.e., lignin; an α-cellulose content of at least 90%; a pH range between 4.5 and 8; and a maximum permissible rosin content of 0.5%. In addition, the micellar structure of the cellulose fibers must not have been impaired during stock preparation; the mill water must be free of heavy metals, iron in particular; fillers must be carefully selected so that the pH does not fall below 4.5; and an excess of alum during sizing must be avoided, as well as the use of fermentable substances. The paper should be stored in the absence of light and heat and not under high moisture conditions. Several methods for increasing the aging resistance of paper are listed. In conclusion, the author presents a brief theory of yellowing. 2 tables and 4 figures. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record, *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets, or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ADHESIVES

MOORE, EDWARD E. Modified starch-urea-formaldehyde water resistant adhesive. U. S. patent 2,629,699. Filed Oct. 20, 1949. Issued Feb. 24, 1953. 13 claims. Assigned to Stein, Hall & Company, Inc. [Cl. 260-17.3]

A dry powder composition consists essentially of 78 parts of a modified starch, 5 to 10 parts of a water-soluble, heat-hardenable amido-formaldehyde condensate (dimethylol urea), 5 to 15 parts of an acidic material (boric acid) giving a 3% aqueous solution with a pH of 5 to 5.5, and 0.5 to 5 parts of an organic sulfo-salt detergent containing 30-40% organic sulfo salt and 60-70% neutral water-soluble inorganic salt (e.g., sodium sulfate). The composition gives a stable adhesive paste with a pH of 5-5.5 and a Brookfield viscosity of 700-3600 centipoises when cooked in a 28.6%-solids aqueous dispersion. The adhesive thus formed can be used for making paper-bag seams and develops a water-resistant bond after drying and standing at room temperature. The starch is characterized as having a water-solubles content of 0-30% and the preferred organic sulfo salt is that of a monosulfuric acid half ester of a monoglyceride of a fatty acid or mixture of fatty acids having 8-18 carbon atoms in the fatty acid radical. Examples of varying percentages and types of components and characteristics of the adhesive formed are given. R.C.R.

BARKERS AND BARKING

DICK, GEORGE M. Hydraulic support for log debarking drum. U. S. patent 2,630,153. Filed March 11, 1952. Issued March 3, 1953. 6 claims. Assigned to Ingersoll-Rand Company. [Cl. 144-208]

A rotatable debarking drum, mounted in a tank containing washing fluid, is supported by shoes having grooved bearing surfaces in sliding contact with tires mounted on the drum. The grooves conduct a lubricant over the bearing surfaces. 5 figures. R.C.R.

EDWARDS, MILES L. Hydraulic log barking apparatus. U. S. patent 2,630,848. Filed July 5, 1947. Issued March 10, 1953. 11 claims. Assigned to Weyerhaeuser Timber Company. [Cl. 144-208]

Logs are fed longitudinally and rotated through a zone of jet action in a barking chamber where one or more nozzles are mounted for oscillation in a common plane. The nozzles, oscillated by means of a fluid cylinder and piston, direct jets of water against the log to remove the bark in a spiral path in one continuous operation. 12 figures. R.C.R.

BLACK LIQUOR—OXIDATION

KRESS, OTTO. Oxidation by air of sulphide sulphur in black liquor. Canadian patent 490,654. Filed Aug. 30, 1949. Issued Feb. 17, 1953. 15 claims. Assigned to The Institute of Paper Chemistry.

An apparatus and method for the treatment of black liquor are adapted to increase its sulfidity and prevent the escape of hydrogen sulfide. The unit comprises a cylindrical tower which contains a series of alternately inclined shelves; the black liquor is introduced at the top of the tower and allowed to cascade downwardly over the shelves, where it encounters an ascending stream of air and is oxidized. This is similar to U. S. patent 2,570,460 (Oct. 9, 1951); *cf.* B.I.P.C. 22: 212. 5 figures. R.C.R.

BOARD

ERICKS, WALTER P. Compositions containing esters of a glycol and polycarboxylic acids and the treatment of cellulose therewith. U. S. patent 2,629,701. Filed May 27, 1949. Issued Feb. 24, 1953. 14 claims. Assigned to The Upson Company. [Cl. 260-29.3]

This is similar to U. S. patents 2,629,648 and 2,629,674 (*cf.* abstracts below). The difference lies in the composition used for impregnating the cellulose-fiber product; it comprises a solvent solution containing 5-60% by weight of a mixture of a thermosetting resin soluble in the solvent and a substantially monoester of a glycol and a dicarboxylic acid in which the molecules of the monoester have the formula HOCRR(CRROCRR)$_x$CRROR'COOH. R has a hydrogen and an alkyl group, R' is a monoacyl radical derived from a dicarboxylic acid and x may be 0 to 150. The amount of the thermosetting resin may vary from 5 to 50% by weight of the mixture and the solvent may be water, aliphatic alcohols with one to three carbon atoms, or ketones with three to five carbon atoms. R.C.R.

ERICKS, WALTER P. Impregnated fibrous wallboard and method of making. U. S. patent 2,629,648. Filed July 7, 1949. Issued Feb. 24, 1953. 19 claims. Assigned to The Upson Company. [Cl. 8-115.6]

Fiber wallboards consisting of felted cellulose pulp fibers (e.g., Upson Board) are stabilized against expansion and contraction with changes in atmospheric humidity by impregnating them with between 1-50% of at least one polycarboxylic acid (I) (e.g., adipic acid, etc.; the acid must boil above 150°C.) in solution in a volatile hydrophilic solvent (e.g., isopropanol). The resulting impregnated boards are dried. The boards may be impregnated at any of a number of stages of their manufacture (stock to finished board) usually at 20-50°, although higher temperatures may be employed. Incorporation of thermosetting resins (5-50%) into the cellulose structures improves the effect of (I), increasing the water resistance and hardness of the impregnated board. R.C.R.

ERICKS, WALTER P. Method for treating cellulose and product thereof. U. S. patent 2,629,674. Filed July 7, 1949. Issued Feb. 24, 1953. 8 claims. Assigned to The Upson Company. [Cl. 117-140]

This is similar to U. S. patent 2,629,648 (*cf.* preceding abstract). The difference lies in the use of a mixture of 5-50% of a thermosetting resin and a polyhydric alcohol boiling at 150°C. or higher instead of one or more polycarboxylic acids. R.C.R.

REDFERN, DONALD V. Method of producing cellulose mass and product. U. S. patent 2,631,097. Filed Nov. 4, 1948. Issued March 10, 1953. 20 claims. Assigned to American-Marietta Company. [Cl. 92-21]

A method of forming a cellulose-fiber product (wet-strength papers, wallboards, insulating and hardboards with a high modulus of rupture, etc.) and a thermosetting, insoluble, infusible phenol-aldehyde resin (I) is claimed. An aqueous slurry (acidic, alkaline, or neutral) which contains the cellulose fibers and 0.5-15% of the water-soluble (I) (preferably 1.5-3.5% based on the ovendry weight of the fiber content) is made acidic to precipitate (I), then deliquified, and the mixture is converted by heating into a dried rigid consolidated fiber product. (I) is retained on the surface of the fibers and is thus available to give the required bonding strength. The resin is formed by gradual heating of an aqueous mixture of a monohydric phenol with a distillation range between 175-225°C., an aldehyde whose aldehyde group is the only reactive radical (formaldehyde), and an alkaline catalyst (sodium hydroxide) not exceeding 10% of the weight of the phenol; the aldehyde and phenol should be present in molar ratios varying from 1:1 to 3:1. The formation of (I) is advanced by repeated additions of an alkali metal hydroxide (sodium hydroxide) with condensation between additions which are terminated while (I) is still water soluble, although precipitable by ethanol. The time required for the preparation and utilization of (I) is relatively short. An alternative method for forming the resin is described. R.C.R.

REDFERN, DONALD V. Production of thermosetting phenol-aldehyde resin condensation products. U. S. patent 2,631,098. Filed Nov. 4, 1948. Issued March 10, 1953. 35 claims. Assigned to American-Marietta Company. [Cl. 92-21]

An alternative method for making the thermosetting phenol-aldehyde resin adhesive described in the preceding U. S. patent 2,631,097 is claimed. The ratio of aldehyde to phenol is reduced to 1:1 or at the most 1.5:1, and the final resin is permanently ethanol and water soluble which is accomplished by varying the addition and condensation procedure. Cellulose fibers are bonded at a hot-press temperature of 230-330°F. (preferably 240-285°) to form hardboards, wallboards, insulating boards, etc. Except for the differences outlined, this patent is similar to the preceding one. R.C.R.

BOARD SPECIALTIES

ARNESON, EDWIN L. Article carrier. Canadian patent 490,670. Filed April 13, 1951. Issued Feb. 17, 1953. 1 claim. Assigned to Morris Paper Mills.

A paperboard carrier which is adapted to hold two large-size bottles incorporates a two-ply medial partition which serves as a bottle separator and which embodies a carrying handle. This is the same as U. S. patent 2,543,821 (March 6, 1951); *cf.* B.I.P.C. 21: 593. 9 figures. R.C.R.

FROEHLIG, RUDOLPH A. Jacket for phonograph records. U. S. patent 2,628,619. Filed June 12, 1952. Issued Feb. 17, 1953. 4 claims. Assigned to Modern Record Albums, Inc. [Cl. 129-16.7]

A cardboard long-playing record jacket includes a tab bearing printed data which is flexibly hinged to the remainder of the jacket by the plies of cover paper. This facilitates identification of individual records in a stack. 4 figures. R.C.R.

HELLAWELL, THOMAS L. Display carton. U. S. patent 2,630,265. Filed Aug. 3, 1948. Issued March 3, 1953. 3 claims. Assigned to Tuk-Bak Trays, Incorporated. [Cl. 229-41]

Collapsible cardboard display cartons for fruits, vegetables, etc. are formed from a single blank; the top of the rectangular carton is open except at the ends, where top panels with foldable free end portions form end-wall closures and are secured in place with tabs. 10 figures. R.C.R.

HOLY, MITCHEL E. Bottle carrier. U. S. patent 2,630,264. Filed April 19, 1949. Issued March 3, 1953. 1 claim. Assigned to Container Corporation of America. [Cl. 229-39]

A collapsible, bottle carrier-type, paperboard carton in the form of an elongated tube with enclosure elements at each end is claimed. Certain of the carton walls have weakened lines which make possible the formation of two sections side by side with a common wall provided with finger openings for carrying purposes. 6 figures. R.C.R.

LAMBERT, RUSSELL A. Display carton. Canadian patent 490,887. Filed May 10, 1951. Issued March 3, 1953. 4 claims.

A cardboard shipping and display carton may be knocked down for shipment, formed into a tube for filling, or set up as an easel-type display. This is the same as U. S. patent 2,557,828 (June 19, 1951); *cf.* B.I.P.C. 21: 814. 7 figures. R.C.R.

LIEBOWITZ, BENJAMIN. Insert board. U. S. patent 2,630,948. Filed Aug. 5, 1950. Issued March 10, 1953. 6 claims. Assigned to Trubenizing Process Corporation. [Cl. 223-71]

A folding or insert board for men's shirts comprises a flat member with extending sharp rear and side edges and an upwardly projecting central collar support which minimizes curling of the collar points. 19 figures. R.C.R.

STEELE, JAMES W. Collar protector for soft shirts. U. S. patent 2,630,949. Filed Aug. 23, 1948. Issued March 10, 1953. 1 claim. [Cl. 223-83]

The support claimed comprises a one-piece inverted-V type cardboard brace with or without a front shirt-engaging tab. 4 figures. R.C.R.

STEPHENS, CHARLES A. Foldable adjustable and mailable advertising display. U. S. patent 2,631,046. Filed Jan. 9, 1952. Issued March 10, 1953. 1 claim. [Cl. 283-56]

A cardboard advertising display, foldable for mailing, comprises a rectangular central body and two side panels articulately secured to it which act as supports for the display. The central body may be subdivided for compact folding, and the edges of the display are reinforced to prevent fraying. 14 figures. R.C.R.

ULLRICH, FRED J. Tray or carton. U. S. patent 2,629,535. Filed Feb. 18, 1949. Issued Feb. 24, 1953. 2 claims. Assigned to Sutherland Paper Company. [Cl. 229-34]

A tray or carton formed from an integral blank can be easily and quickly erected by securing the sides in their upright position by a series of reinforcing flaps extending from the ends of each wall part. 5 figures. R.C.R.

YANCEY, CHARLES R. Attachable closure for containers. U. S. patent 2,628,761. Filed Aug. 20, 1949. Issued Feb. 17, 1953. 6 claims. Assigned 45% to Katherine Knapp Yancey, and 10% to E. Hastings Ackley. [Cl. 229-7]

A one-piece closure attachment (I) includes a frame member with an aperture, flaps for affixing (I) to the carton, and a detachable elongate closure gate. The gate slides up between (I) and the carton to seal the aperture after the carton has been opened. (I) is designed for use on the side wall of folding or setup cartons (overwrapped or not) and can be made of sheet cardboard or plastic. 3 figures. R.C.R.

ZALKIND, PHILIP. Reinforced folder. U. S. patent 2,631,589. Filed Oct. 17, 1944. Issued March 17, 1953. 3 claims. [Cl. 129-16.7]

Paper or fiber file folders are reinforced by folding multiple creases in the upper edge of either or both panels to form a removable tab-holding groove. Fiber, plastic, wood, etc. reinforcing members, inserted in the bends, may extend beyond the panel to form suspending means for the folder. 8 figures. R.C.R.

CALCIUM CARBONATE

SCHUR, MILTON O., and LEVY, ROBERT M. Process of producing noncolloidal calcium carbonate. U. S. patent 2,631,922. Filed Aug. 3, 1949. Issued March 17, 1953. 2 claims. Assigned to Ecusta Paper Corporation. [Cl. 23-66]

To produce calcium carbonate (I) suited for use as a filler in cigarette paper, a slaked lime slurry cooled to 15-25°C. containing 220-280 grams of (I) per liter is treated with gas containing 8-12% carbon dioxide to effect carbonation with gradually increasing temperatures up to 50-60°, until the calcium hydroxide had been converted almost completely into noncolloidal (I). L.E.W.

CELLULOSE—REACTIVITY

HILLER, LEJAREN A., JR. Activation of cellulose. U. S. patent 2,631,144. Filed Oct. 23, 1950. Issued March 10, 1953. 7 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 260-229]

Oven drying cellulose (e.g., wood pulp, cotton linters) to a moisture content of 1-2% at 75-125°C. before esterifying with acid anhydrides in the presence of a basic catalyst and with or without organic compounds such as N-formyl morpholine or N,N-dimethylformamide, activates the cellulose to give higher yields in less time. After an initial heat treatment, rewetting of the cellulose does not reduce its increased reactivity. R.C.R.

COIR

FLORO, MARTINIANO. Coconut husk defibering machine. U. S. patent 2,630,602. Filed April 25, 1947. Issued March 10, 1953. 4 claims. [Cl. 19-12]

Rotary conical scrapers remove coconut coir dust and short fibers from the husks of the nuts and so separate the clean bristle fibers as well as spinnable coir fibers. 4 figures. R.C.R.

FLOOR COVERING

HORNBERGER, CLARENCE L. Web accumulator. U. S. patent 2,631,847. Filed April 19, 1949. Issued March 17, 1953. 5 claims. Assigned to Armstrong Cork Company. [Cl. 271-2.2]

A web accumulator for floor and wall coverings consists of a series of rollers at the top of a framework and another series of rollers at the bottom carried by a vertically movable cradle supported by the sheet material in the accumulator. A variable counterweight attached to the cradle by a chain passing over a sprocket is claimed as a device for preventing the rapid drop of the cradle in the event of material breaks. A device is also provided for lifting the cradle to the top of the framework to facilitate threading material at the start of a run. 4 figures. R.C.R.

SCHUELER, FRED C. Process for making asphalt impregnated floor covering. U. S. patent 2,631,946. Filed Sept. 16, 1948. Issued March 17, 1953. 6 claims. Assigned to The Schueler Engineering Co. [Cl. 117-45]

A moving felted web of vegetable, synthetic, or animal fibers is covered with a decorative thermosetting plastic on one side, subjected to heat, and subsequently treated on the uncoated side with a controlled amount of asphalt. The web is then heated sufficiently to liquify the asphalt to cause its impregnation into the backing web. 6 figures. L.E.W.

FOLDING BOXES

FRANKENSTEIN, WILLIAM P. Carton. U. S. patent 2,628,763. Filed Jan. 3, 1947. Issued Feb. 17, 1953. 14 claims. [Cl. 229-31]

Knockdown cartons of the hollow-wall type are strengthened by providing one or more transverse ribs or braces which specifically prevent inward bulging of either the inner or outer wall members. 20 figures. R.C.R.

RINGLER, WILLIAM A. Container. U. S. patent 2,630,263. Filed Aug. 31, 1945. Issued March 3, 1953. 6 claims. Assigned to The Gardner Board and Carton Co. [Cl. 229-31]

A polygonal, liquid-tight, self-locking paperboard container for frozen foods, ice cream, etc. is set up from a single creased blank. The side walls are interconnected by gusset panels which provide the liquidproofness of the container. 17 figures. R.C.R.

GASTIGHT PACKAGING

BERGSTEIN, SAMUEL. Watertight and gastight shipping container. U. S. patent 2,630,262. Filed July 16, 1948. Issued March 3, 1953. 4 claims. [Cl. 229-3.1]

A corrugated or fiberboard shipping container is covered with a moisture-, vapor-, and gastight sleeve seamed to itself. A second kraft paper or board sleeve covers the first, leaving exposed margins at each end; these ends are dipped in a heat-softened thermoplastic substance, and a molding device presses a flexible cover member over the ends of the case, thereby sealing it. 12 figures. R.C.R.

GUMS AND RESINS

MCELHINNEY, THOMAS R., and WOODRUFF, THOMAS D. Thermoplastic resins formed from pinewood pitch. U. S. patent 2,628,917. Filed Oct. 11, 1949. Issued Feb. 17, 1953. 24 claims. Assigned to Valite Corporation. [Cl. 106-222]

Pinewood stumps are steamed to remove the volatile oils and then extracted with a hot solvent. A resinous material settles out on cooling and re-extraction gives another residue, low in abietic acid. This residue constitutes the pinewood pitch (I) used in the invention. (I), 100 parts by weight, furfural, 10 parts, and linseed oil, 6 parts, heated in combination and with agitation from room temperature to 210-250°C. in an open kettle form a permanently thermoplastic modification product; this can be used as a substitute for shellac as a binder in phonograph records. R.C.R.

INSULATION AND INSULATING MATERIALS

COLE, THOMAS D. Thermal insulating material and method of making the same. U. S. patent 2,631,644. Filed May 7, 1949. Issued March 17, 1953. 8 claims. Assigned to Lockport Cotton Batting Co. [Cl. 154-28]

Building insulation panels or batts are made of thin films or webs of matted fibrous material (of animal, vegetable, or mineral origin) divided into alternate zones, parallel to each other and crosswise of the direction of feed of the webs. In one series of zones, the web is folded back on itself and in other zones, it is fed straight across without folding. This latter zone provides for larger air cells between the fibers and the layers. 2 figures. R.C.R.

INTERIOR PACKING

LOTH, GAYLORD. Article isolating shipping containers. Canadian patent 490,975. Filed Oct. 12, 1950. Issued March 3, 1953. 3 claims. Assigned to The Hinde & Dauch Paper Company.

A paperboard carton incorporates a pair of article-isolating buffer members which are adapted to support and protect a fragile article during shipment. This is the same as U. S. patent 2,553,418 (May 15, 1951); *cf.* B.I.P.C. 21: 749. 5 figures. R.C.R.

SOMMERHAUSER, LOUIS P. Hat packing box. U. S. patent 2,631,721. Filed Feb. 28, 1952. Issued March 17, 1953. 3 claims. [Cl. 206-8]

A hat-storage and -shipping container for one or more felt hats is provided with a cardboard or heavy-paper cradle made up of four supporting members spaced around the inner walls of the box; the crowns will not hit the bottom of the container nor will the brims come in contact with the sides. 3 figures. L.E.W.

WRIGHT, ERNEST C. Tray. U. S. patent 2,631,724. Filed June 2, 1950. Issued March 17, 1953. 4 claims. Assigned to Union Bag & Paper Corporation. [Cl. 206-65]

Corrugated board trays for shipping and supporting cones of yarn are formed of two rectangularly shaped pieces which can be shipped and stored flat and unassembled. Triangular projections from the tray act as spindles

for supporting the cones out of contact with the tray and container. 6 figures. R.C.R.

LIGNIN

HERITAGE, CLARK C., and VAN BECKUM, WILLIAM G. Process for producing lignin products. Canadian patent 491,228. Filed March 10, 1948. Issued March 10, 1953. 8 claims. Assigned to Weyerhaeuser Timber Company.

A process is adapted for the manufacture of lignin products from lignocellulosic materials which is particularly applicable to the woods of aspen, jack pine, western larch, Douglas-fir, and western red-cedar. As an example, Asplund western red-cedar fiber is extracted with sodium hydroxide, and the extract is concentrated. This extract is filtered to separate a lignin fraction, which is boiled in water to further separate it into water-insoluble and water-soluble fractions. The insoluble portion is removed by filtration, dried, and thus made available for utilization in various applications. The neutral, aqueous solution is subjected to varying procedures to obtain a lignin product in any one of several forms. This is the same as U. S. patent 2,541,059 (Feb. 13, 1951); *cf.* B.I.P.C. 21: 513. 1 figure. R.C.R.

MACHINERY—BEATERS

HAYES, FRANK. Paper stock distributor for beaters. U. S. patent 2,630,044. Filed June 21, 1948. Issued March 3, 1953. 3 claims. Assigned to Noble & Wood Machine Company. [Cl. 92-22]

A V-shaped strut is secured to the beater frame above the inlet pipe in a hollander-type beater in which the bed plate and beater roll are located outside the stock-containing tub. The strut slants inwardly and downwardly and has a conical deflector head integral with it. The upper part of the stock entering from the inlet pipe impinges against the strut in a downward direction equally to each side, whereas the lower part of the stock impinges against the deflector and moves uniformly downwardly and radially. 4 figures. R.C.R.

MACHINERY—CARTON-FEEDING MECHANISM

JONES, WICKLIFFE. Vibratory feeder for carton flats and the like. U. S. patent 2,631,851. Filed July 27, 1950. Issued March 17, 1953. 9 claims. Assigned to The R. A. Jones and Company. [Cl. 271-62]

Collapsed knock-down cartons, flat paperboard, sheets of paper, etc. in bulk quantity stacked perpendicularly to a horizontal vibratory rack or rail and in edge-bearing engagement upon the rack are jogged and unitarily advanced toward a discharge end. The rack, mounted on flexible leaf springs, is vibrated at high speed by an electromagnet energized by a regulatably controlled pulsating electric current. 6 figures. R.C.R.

MACHINERY—CONVERTING MACHINERY

BARTLETTE, DANIEL, and LOWE, EDWARD C. Box-blank cutting assembly. U. S. patent 2,628,543. Filed Dec. 11, 1950. Issued Feb. 17, 1953. 7 claims. [Cl. 93-58]

An assembly for cutting cardboard box blanks includes a self-feeding conveyor and flap-lifting means controlled by passage of the blanks through the machine. This permits the cutting of box blanks having different flap widths in one operation. 11 figures. R.C.R.

GAMBLE, HEDWIG. Machine for making filter and like tips for cigarettes. U. S. patent 2,628,541. Filed Nov. 8, 1950. Issued Feb. 17, 1953. 6 claims. [Cl. 93-1]

The machine comprises a rotatable drum having a number of slots into which pieces of crepe paper are fed and a presser movable into each slot in turn to form the paper into a stub which is then ejected axially from the chamber formed by the ends of the presser and slot. 5 figures. R.C.R.

GERARD, GEORGE A. Apparatus for preparing and dispensing adhesive coated tape. U. S. patent 2,631,562. Filed June 2, 1950. Issued March 17, 1953. 8 claims. [Cl. 118-43]

A dispenser for adhesive coated tape includes a roll for the tape, means for applying a pressure sensitive substance to one side of the tape as it leaves the roll and tape guides to aid in extraction of the coated tape. 8 figures. R.C.R.

HARRISON, EDGAR. Apparatus for forming paper crackers. U. S. patent 2,631,417. Filed Dec. 5, 1949. Issued March 17, 1953. 7 claims. Assigned to Tom Smith & Co., Ltd. [Cl. 53-92]

The machine claimed automatically rolls paper cylinders, crimps two "waists" at opposite ends of the cylinder, and "ties" off the waists to form paper crackers (snappers, used as party favors) in a continuous operation. 10 figures. R.C.R.

LOESER, DONALD B. Machine for fabricating laminated signatures provided with sheet metal inserts. U. S. patent 2,629,423. Filed Dec. 9, 1949. Issued Feb. 24, 1953. 9 claims. Assigned to The Sorg Paper Company. [Cl. 154-1.6]

The machine claimed spaces sheet-metal inserts between adhesively joined webs of paper and cuts the laminated web widthwise and lengthwise to form laminated sheets having metal inserts at opposite sides of the sheets. The inserts permit ready separation or handling of cards. 17 figures. R.C.R.

MUEHLING, ANTHONY A. Web pleating and cutting machine. U. S. patent 2,631,508. Filed Sept. 24, 1948. Issued March 17, 1953. 16 claims. Assigned to Bendix Aviation Corporation. [Cl. 93-1]

A machine for fabricating filter elements from paper-sheet material creases and pleats the material, cuts it into predetermined lengths, folds the pleated sheet into hollow articles, trims them, and then cuts them to the desired size. 15 figures. R.C.R.

PALMER, CHARLES E. Box forming machine. Canadian patent 491,003. Filed March 26, 1952. Issued March 3, 1953. 22 claims. Assigned to Package Machinery Company.

A boxmaking machine is adapted for folding prescored or creased paperboard blanks into box form and adhesively securing the box in its setup condition. The machine is adapted for setting up boxes with single-ply side walls and boxes with two-ply side and/or end walls. This is the same as U. S. patent 2,599,008 (June 3, 1952); *cf.* B.I.P.C. 22: 874. 45 figures. R.C.R.

ROWLANDS, TOM. Former for cartons. U. S. patent 2,630,047. Filed June 5, 1951. Issued March 3, 1953. 1 claim. [Cl. 93-77]

A former for carton bodies is grooved to accommodate creases in the carton material; its sides are shaped to the form of a shallow concave surface which permits the ready removal of the finished carton from the former. 2 figures. R.C.R.

MACHINERY—CREPING MACHINE

STEVENSON, ALLAN B. Manufacture of creped paper. U. S. patent 2,628,656. Filed July 29, 1950. Issued Feb. 17, 1953. 2 claims. Assigned to American Reenforced Paper Company. [Cl. 154-30]

A method and apparatus for creping paper (including comparatively lightweight papers for box-stay tapes and other wrapping and packaging purposes) to impart stretchability in all directions are claimed. The web is drawn through a series of apertured dies with funnel- or bell-shaped entrances; successive dies have throats of successively diminishing sizes to contract the paper gradually to ropelike form. The paper is then squeezed between rolls, after which it is fanned out to its creped dimension widthwise, dried, and wound into rolls. 8 figures. R.C.R.

MACHINERY—CUTTERS

NIX, JOHN C., III. Paper cutter for paper mill drying rollers. U. S. patent 2,629,182. Filed Feb. 4, 1948. Issued Feb. 24, 1953. 9 claims. [Cl. 34-85]

A paper cutter movable longitudinally between the triangularly arranged drying rollers embodies a rotatable cutter positioned to travel longitudinally along any one of the rollers to cut the broken or torn paper therefrom and to facilitate its removal. The cutter is mounted on one of a number of arms radially projecting from a central body. 6 figures. R.C.R.

RUMSEY, HERBERT, JR. Apparatus for cutting flexible sheet material. Canadian patent 490,561. Filed Sept. 23, 1948. Issued Feb. 17, 1953. 2 claims.

Cellophane (or paper, cellulose acetate, etc.) is severed by a cutting knife with a smooth uniform cut without damaging or wrinkling by the provision of gripping disks of soft rubber for holding the sheet in position. 4 figures. R.C.R.

SEYBOLD, FREDERICK W. Guillotine knife-automatic electrical back gauge. U. S. patent 2,628,680. Filed Sept. 2, 1949. Issued Feb. 17, 1953. 10 claims. Assigned to E. P. Lawson Co., Inc. [Cl. 164-48]

An automatic, photoelectrically controlled back gage-spacing mechanism is claimed which will adjust the back gage of guillotine-type paper cutters at successive, individually predetermined intervals after successive cuts. 8 figures. R.C.R.

SHAW, JAMES M., and FAUS, LESLIE I. Automatic paper-cutting machine. U. S. patent 2,629,440. Filed July 11, 1946. Issued Feb. 24, 1953. 20 claims. Assigned to Harry Rosenthal. [Cl. 164-49]

A paper-cutting machine mounted on a wrapping table is arranged to feed

paper automatically from a roll onto the table and cut off the paper at the desired lengths by means of a combined electrical and pneumatic control system. 6 figures. R.C.R.

MACHINERY—DECURLING MACHINERY

SCHWAB, JOHN J., and WAHL, OTTO. Paper web straightening device. U. S. patent 2,631,507. Filed Jan. 31, 1948. Issued March 17, 1953. 1 claim. Assigned to W. J. Bradford Paper Co. [Cl. 92-70]

In a decurling or straightening apparatus, the paper web is trained from a lower elevation, over a straightening roll, under a guide rod, and then under a drag plate. Passing over the straightening roll, the web is bowed or curved in reverse to the curvature as wound upon the supply roll. The straightening roll is adjusted for moderate or severe decurling by loosening or tightening the locking bolt. 2 figures. R.C.R.

MACHINERY—DRYERS

OSTERTAG, HARRY M. Yankee drier. U. S. patent 2,628,433. Filed May 25, 1950. Issued Feb. 17, 1953. 10 claims. Assigned to Scott Paper Company. [Cl. 34-124]

A Yankee dryer is claimed which comprises a cylindrical shell, an axial shaft in the shell, and a head member at each end of the shell attached to it and the shaft, forming an enclosed chamber for pressure under steam. Members at each end of and within the chamber support the shell in coaxial relation on the shaft and relieve the head members of any supporting function. 4 figures. R.C.R.

MACHINERY—FILTERS

VOCELKA, JOHN. Fiber disk filter assembly. U. S. patent 2,631,732. Filed Nov. 8, 1950. Issued March 17, 1953. 3 claims. Assigned to Wm. W. Nugent & Co., Inc. [Cl. 210-169]

A filter stack (claimed to provide maximum filtering capacity) consists of a plurality of concentric filter disks (made of paper, pulp, etc.), all of which have central equilateral polygonal apertures. Some of the disks are otherwise uncut, whereas others have series of radially disposed, equally spaced, crenelated loops, which are open along their outer sides to the periphery of the disk. Both types of disks are stacked alternately in the assembly. 5 figures. L.E.W.

MACHINERY—FOLDING MACHINE

SABEE, REINHARDT N. Delivery mechanism for tissue interfolding apparatus. U. S. patent 2,631,846. Filed May 13, 1949. Issued March 17, 1953. 4 claims. Assigned to International Cellucotton Products Company. [Cl. 270-39]

Facial tissues can be folded rapidly (800 folds per minute) and with a minimum of strain by simplification of the folding rolls to employ fixed tuckers, use of rubber friction tips to control the tucked-in-web, arrangement of the tucker and jaws so they do not pinch the web, etc. Tissue paper, creped tissue paper, and double-ply creped tissue paper may be either Z-folded or interfolded by the apparatus claimed. 13 figures. R.C.R.

MACHINERY—HEAD BOX

HORNBOSTEL, LLOYD. Flow distributor. Canadian patent 491,108. Filed Nov. 18, 1950. Issued March 10, 1953. 10 claims. Assigned to Beloit Iron Works.

A headbox is equipped with an adjustable baffle or partition, and one or more imperforate rolls which are closely spaced with relation to the baffle and the bottom wall of the headbox. By a proper adjustment of the clearances and the speed and direction of rotation of the rolls, it is possible to control the head of stock flowing onto the wire, as well as the level of the stock at the screens. This is the same as U. S. patent 2,548,108 (April 10, 1951); *cf.* B.I.P.C. 21: 667. 5 figures. R.C.R.

MACHINERY—PACKAGING MACHINERY

BANKS, CHARLES T. Packaging machine. U. S. patent 2,631,767. Filed Feb. 21, 1948. Issued March 17, 1953. 23 claims. Assigned to International Cellucotton Products Company. [Cl. 226-14]

Manual handling of soft, compressible articles (i.e., sanitary napkins) is avoided by use of a machine which operates continuously at a relatively high rate of speed. Conveyors receive the stacks of articles directly from the machines and deliver them into waiting boxes. 17 figures. R.C.R.

JONES, DAVID D., and BANKS, CHARLES T. Packaging apparatus and method. Canadian patent 490,655. Filed April 22, 1950. Issued Feb. 17, 1953. 28 claims. Assigned to International Cellucotton Products Company.

A machine for automatically stacking a plurality of articles (sanitary napkins, facial tissues, etc.) in groups of predetermined numbers is claimed. 19 figures. R.C.R.

RIEMER, JOHN. Package top sealing apparatus. U. S. patent 2,629,977. Filed Nov. 4, 1947. Issued March 3, 1953. 5 claims. Assigned to Kraft Foods Company. [Cl. 53-144]

An apparatus is claimed which permits the transfer of open-topped paperboard packages with thermoplastic inner liners from a filling machine to a continuously moving conveyor, which conducts the packages through a mechanism for the transverse and longitudinal sealing of the liners. 16 figures. R.C.R.

ROSS, ALEXANDER H. Adjustable conveyer for cartoning machines. U. S. patent 2,628,542. Filed Sept. 17, 1945. Issued Feb. 17, 1953. 4 claims. Assigned to Emhart Manufacturing Company. [Cl. 93-49]

An adjustable packaging machine for erecting cartons from flat-folded blanks by a squeezing action exerted by a plurality of fingers which constitute part of a continuous conveyor is claimed. 37 figures. R.C.R.

MACHINERY—PASTING MACHINE

PALMER, CHARLES E. Apparatus for applying adhesive to box blanks and the like. Canadian patent 490,818. Filed Dec. 8, 1950.

Issued Feb. 24, 1953. 11 claims. Assigned to Package Machinery Company.

An adhesive-applying and -drying machine is constructed for the application of a thermoplastic adhesive to a carton blank which, when supplemented by a bottom inset, is subsequently converted into a milk container. This is the same as U. S. patent 2,549,000 (April 17, 1951); *cf.* B.I.P.C. 21: 669. 17 figures. R.C.R.

RICHARDSON, RALPH R., RITTER, WALTER T., RAGAN, ROBERT O., and COY, DON W. Box sealing method and apparatus. U. S. patent 2,631,642. Filed July 22, 1949. Issued March 17, 1953. 17 claims. Assigned to Chicago Carton Company. [Cl. 154-1]

An automatic, continuous package-sealing apparatus is claimed, with which rectangular cartons with flaps at either end, marginally coated with thermoplastic substances, are sealed by application of high-frequency currents to the coated box surface already folded into position. 19 figures. R.C.R.

ULMSCHNEIDER, LAWRENCE A. Apparatus for sealing wrapping material. U. S. patent 2,629,808. Filed Nov. 15, 1950. Issued Feb. 24, 1953. 6 claims. Assigned to Eastman Kodak Company. [Cl. 219-19]

Two edges of wrapping material (paper coated with aluminum foil on one side and polyethylene on the other) are sealed by heating the plastic facing surfaces until they fuse and adhere while the edges are held together and passed through a serpentine or wavy path. 5 figures. R.C.R.

MACHINERY—PRESSES

BURROWS, EASTMAN A. Apparatus for making wallboard. U. S. patent 2,631,381. Filed July 10, 1947. Issued March 17, 1953. 3 claims. Assigned to Stanley D. Libbey. [Cl. 34-144]

Wallboards produced as green or uncured sheets and formed by the introduction of a plastic material to be intumesced between paper liners are cut into sheets and delivered singly by a conveyor between sets of heated platens. The platens are automatically heat controlled and means are provided for perforating the edges of the board (to provide nail holes) during the curing operation. 13 figures. R.C.R.

MACHINERY—PRINTING MACHINE

WOOD, WAYNE A. Machine for printing erected cartons. U. S. patent 2,631,528. Filed Aug. 29, 1949. Issued March 17, 1953. 4 claims. Assigned to Sutherland Paper Company. [Cl. 101-44]

A machine for printing erected cartons is claimed which may be used in connection with a carton-erecting machine. A type holder receives a printing block (manually changed), automatically inks it on a cylindrical rotatable pad, and stamps the carton moving by on a conveyor. 6 figures. R.C.R.

MACHINERY—PUNCHING MACHINERY

KANE, GIDEON. Web perforating mechanism. U. S. patent 2,628,681. Filed Feb. 3, 1951. Issued Feb. 17, 1953. 2 claims. [Cl. 164-99]

A perforating mechanism for a traveling web of sheet material for punching holes at spaced intervals comprises the combination of a pair of rotatable rolls, one having radially disposed punches and the other a peripheral groove. An anvil ring mounted in the outer portion of the groove is capable of movement relative thereto and is provided with a wear-resistant, punch-contacting surface and a resilient plastic backing. 3 figures. R.C.R.

MACHINERY—REFINERS

ARPIN, EDMUND P., JR., and FRYE, RAYMOND P. Rotary refiner. U. S. patent 2,631,504. Filed July 7, 1948. Issued March 17, 1953. 11 claims. Frye's interest assigned to Arpin. [Cl. 92-26]

Each rotor stone of a rotary refiner is held in a housing or backing plate by a number of adjustable wedge-shaped members which are securely held in place by bolts. A pressure pad, disposed between the rotor stone and several wedge members, assures a uniform application of pressure and thus minimizes the possibility of stone rupture or uneven wearing of the stone surface. This corresponds to Canadian patent 478,619 (Nov. 13, 1951); *cf.* B.I.P.C. *22*: 375. 8 figures. R.C.R.

ARPIN, EDMUND P., JR., and FRYE, RAYMOND P. Rotary refiner liner construction. U. S. patent 2,631,505. Filed Aug. 10, 1948. Issued March 17, 1953. 2 claims. Frye's interest assigned to Arpin. [Cl. 92-26]

A rotary refiner is provided with a liquid-cooled abrasive liner. The liner comprises a number of half-ring members which are suitably bonded to a semicylindrical backing member; a unitary structure is formed which may be handled with a chain fall or the like for positioning or removal from the casing. This corresponds to Canadian patent 477,730 (Oct. 9, 1951); *cf.* B.I.P.C. *22*: 221. 4 figures. R.C.R.

MACHINERY—SCREENS

AHLFORS, STEN E. E. Wet-treating fibrous matters. U. S. patent 2,632,366. Filed July 8, 1946. Issued March 24, 1953. 3 claims. [Cl. 92-33]

Liquid suspensions of fibers can be strained, classified, dewatered, and washed by an apparatus comprising an upper vat with a strainer element for its bottom and a second vat below the first and connected to it by a flexible diaphragm. Both vats are supported by resilient means (the second from a foundation, the first from the second vat); vibratory means suspended from the upper vat are adapted to vibrate the strainer and part of the lower vat with mutually different amplitudes causing part of the fiber suspension to pass through the strainer and be discharged at one side, whereas the rejected portion is discharged at the opposite side. The output per unit area of the vibrating strainer element is increased by simultaneously vibrating the opposite nonperforated element (lower vat) at a different amplitude, so that both elements act positively on the suspension. 11 figures. R.C.R.

JÖNSSON, NILS W., and LINDGREN, KARL O. Vibratory rotary screening mechanism. U. S. patent 2,631,506. Filed Oct. 29, 1946. Issued March 17, 1953. 3 claims. Assigned to Aktiebolaget A. Ekströms Maskinaffär. [Cl. 92-36]

Stresses on the screen construction are reduced by elastically mounting the nonvibrating base or vat for the vibrating screening member on springs

or the like, whereby two interconnected swinging systems held on the same stationary base are obtained. The ratio of the weight of the screen to the weight of the vat in which it is mounted is preferably 1:1.25. 2 figures.
R.C.R.

MACHINERY—SLICE

TEALE, BENJAMIN E. Papermaking apparatus. U. S. patent 2,630,045. Filed June 21, 1950. Issued March 3, 1953. 1 claim. [Cl. 92-44]

A slice of unitary construction is claimed which may be located as desired along the pond plates; it is stiffened and reinforced so that it is rigid and strong when made in long lengths without losing the necessary flexibility. Elongated vertically disposed and transversely spaced pond plates and stationary deckles obviate the prior-art, endless-band deckles. 4 figures.
R.C.R.

MACHINERY—WEB-FEEDING MECHANISM

JOHNSON, WILLIAM E., and HILLEN, HUBERT J. Apparatus for feeding webs of paper. U. S. patent 2,630,901. Filed Dec. 2, 1950. Issued March 10, 1953. Assigned to Powers-Samas Accounting Machines Limited. [Cl. 197-133]

Plain or perforated webs of paper can be fed to statistical machines by the detachable feeding apparatus claimed which comprises a rotatable platen for the former and a pin-type feed for the latter. The pin wheels may be axially adjusted for alignment of the web and the platen can be disconnected during operation of the pin-type feed. 9 figures. R.C.R.

MOLDED PULP ARTICLES

CHAPLIN, MERLE P. Molded fiber article. U. S. patent 2,629,533. Filed April 18, 1945. Issued Feb. 24, 1953. 2 claims. Assigned to Chaplin Corporation. [Cl. 229-2.5]

The molded pulp article comprises an open-faced fibrous receptacle body (I) with a smooth and unobstructed inner surface, an integral thickened reinforcing edge around the periphery of (I) and walls exteriorly thickened at intervals to form solid integral ribs on the outer surface of (I). The inner surface, reinforcing edge, and outer surface between the ribs have a hot-pressure, die-dried finish; the ribs have a hot-vapor dried finish. The finished article can be used as a cup, dish, etc. 33 figures. R.C.R.

RANDALL, WALTER H. Molded pulp wad. U. S. patent 2,628,560. Filed Jan. 26, 1952. Issued Feb. 17, 1953. 2 claims. Assigned to Keyes Fibre Company. [Cl. 102-95]

The suction-molded cylindrical pulp wads for use in shot shells and small arms ammunition are made preferably of half groundwood and half chemical pulp by the machine and method described in U. S. patent 2,628,540 (Feb. 17, 1953); *cf.* B.I.P.C. 23: 526. 8 figures. R.C.R.

PACKAGING

DARDEN, EDNA D. Method of packaging material. U. S. patent 2,628,907. Filed Sept. 7, 1951. Issued Feb. 17, 1953. 1 claim. [Cl. 99-171]

The invention comprises a paper carton, a separate flexible oversize impervious liner in which the food is sealed, and a relatively rigid open-ended measuring device with a funnel mouth adapted to be telescoped into the carton. The package is suitable for use in freezing and storing frozen food. 3 figures. R.C.R.

ELLSWORTH, HAROLD I. Corner cushioning packaging device. U. S. patent 2,631,723. Filed Dec. 8, 1949. Issued March 17, 1953. 3 claims. [Cl. 206-60]

A cardboard package protector with rounded edges is so constructed that it provides a cushion along the bending lines and at the corners of the package to prevent damage during transport. 7 figures. L.E.W.

PACKAGING—OPENERS

HALL, CHARLES T. Device for opening shells of slide and shell cartons. U. S. patent 2,630,742. Filed Jan. 23, 1950. Issued March 10, 1953. 3 claims. Assigned to Molins Machine Company Limited. [Cl. 93-53]

Flattened cigarette cartons (shells) can be opened by external pressure in a device comprising a fixed ramp, a presser member designed to engage a corner of the carton and move it up the ramp, and a second L-shaped presser member designed to engage and apply pressure to the opposite corner of the shell, effecting a full opening. 5 figures. R.C.R.

PAPER—COATED

COWAN, JOHN C., FALKENBURG, LEE B., and LEWIS, ARTHUR J. Method of bonding sheet materials and coating compositions therefor. U. S. patent 2,630,397. Filed Dec. 27, 1948. Issued March 3, 1953. 13 claims. Assigned to the United States of America as represented by the Secretary of Agriculture. [Cl. 154-138]

A coating composition for moisture-vaporproofing cellulosic sheet materials (kraft and glassine papers, cellophane) comprises an alkylenediamine (2-6 carbon atoms) polyamide (molecular weight 3000-9000) of polymerized polyene fatty acids, 0.2-5% paraffin wax, a plasticizer (e.g., phenol-modified coumarone-indene) and a volatile solvent. The type and amount of wax vary depending on the type of coating desired; the plasticizer may be omitted in some instances. A heat- and pressure-fusible coating for similar types of material employs an ethylenediamine polyamide resin (molecular weight 3000-9000) prepared by heating ethylenediamine with a polymeric amide-forming substance from the group of polymerized polyene fatty acids, their esters, and anhydrides. Laminated sheet materials can be bonded together with a heat-seal film of a polyamine polymeric soybean-oil polyene fatty acid polyamide resin. R.C.R.

DICKHAUT, CHARLES A., and NEWCOMB, BENJAMIN R. Method and apparatus for coating webs. Canadian patent 491,209. Filed Feb. 11, 1947. Issued March 10, 1953. 11 claims. Assigned to John Waldron Corporation.

In the method and apparatus claimed, an air blast serves to doctor excess coating composition from the paper web. This is the same as U. S. patent 2,545,266 (March 13, 1951); *cf.* B.I.P.C. 21: 598. 5 figures. R.C.R.

PAPER SIZING

WILSON, WILLIAM S., and BUMP, ALBERT H. Sizing agents. U. S. patent 2,628,918. Filed May 6, 1952. Issued Feb. 17, 1953. 9 claims. Assigned to Monsanto Chemical Company. [Cl. 106-238]

A paper-sizing adjunct is claimed which comprises an aqueous dispersion of the unesterified reaction product of 1/20 to one mole of an acidic organic compound containing a -CO-C=C group (e.g., maleic anhydride) with one mole of rosin. The dispersion is partially neutralized and contains 50-80% of the reaction product, 4-14% of an alkali metal base, and 6-46% of water. Bleached kraft, sulfite, rag, and alpha pulps showed better sizing when the compound was used in addition to rosin. R.C.R.

PAPER SPECIALTIES

COFFIN, HARRY B. Mailing sheet. U. S. patent 2,631,773. Filed Aug. 9, 1946. Issued March 17, 1953. 4 claims. [Cl. 229-92.1]

A combination letter, booklet, order blank, and reply envelope comprises a number of sheets so arranged that when opened by the recipient they will appear and be read in the proper sequence. 14 figures. R.C.R.

DAFTER, EDWIN H., JR. Methods of surfacing wood and similar materials with copolymerizable mixtures. U. S. patent 2,631,960. Filed March 21, 1951. Issued March 17, 1953. 12 claims. Assigned to American Cyanamid Company. [Cl. 154-121]

A method of surfacing pressed board or plywood with a solid copolymer is claimed. The copolymerizable mixture (I) contains an unsaturated alkyd resin and a material having the CH_2: C: group (e.g., styrene) and a boiling point of at least 60°C., together with a suitable catalyst like an organic peroxide. (I) is applied to a sheet of fibrous material (cloth, paper, etc.) (II) and subjected to heat. The pressed board or plywood is then covered successively with an adhesive and the coated (II) and this, in turn, is covered with (I) and a smoothly-surfaced superimposed metal plate or sheet of cellophane (III). The assembly is subjected to heat and pressure, and (III) is subsequently removed. L.E.W.

DOYLE, JOSEPH C. Carbon paper pack for manifolding typewriters. U. S. patent 2,631,868. Filed Feb. 16, 1951. Issued March 17, 1953. 1 claim. Assigned to Kee Lox Manufacturing Co. [Cl. 282-1]

The carbon sheets are surrounded by a paper wrapper and attached (stitched at one end) to a backing sheet; both the wrapper and carbon pack can be detachably secured to the supporting bar of the typewriter. 7 figures. R.C.R.

FOWLER, WILLIAM F., JR., and SPEAR, DONALD R. Manufacture of high wet strength paper. U. S. patent 2,632,699. Filed June 17, 1950. Issued March 24, 1953. 9 claims. Assigned to Eastman Kodak Company. [Cl. 92-3]

To 60-70 parts of a paper pulp suspension is added a composition of 1-5 parts of a water-soluble salt (alkali metal, ammonium, etc.) of 1-pimaric acid-maleic anhydride adduct, 1-20 parts of a water-soluble styrene-acrylate resin (*n*-butyl methacrylate, *n*-propyl acrylate, etc.) in which the styrene amounts to 40-75%, and 2-20 parts of aluminum chloride. The photographic paper thus prepared has good size resistance, high wet strength, and good

resistance to ultraviolet light. Data for various combinations of the components, results of physical property tests on experimental handsheets, and methods of preparation for the adduct and the resin are given in detail. R.C.R.

HAGE, HILDUR. Dust collecting bag and filter for vacuum cleaners. U. S. patent 2,630,879. Filed April 15, 1950. Issued March 10, 1953. 1 claim. [Cl. 183-51]

A disposable paper bag with a permanent or detachable cellulose filter is designed for ready installation and removal from a vacuum-cleaner casing. The bag is secured to the bottom of the casing either adhesively or with a holding device. 3 figures. R.C.R.

HERFORD, GEOFFREY V. B., and OXLEY, THOMAS A. Protection of packages. U. S. patent 2,630,911. Filed April 1, 1949. Issued March 10, 1953. 12 claims. [Cl. 206-10]

An insect-destroying packaging material comprises labyrinthine layers of cellulose wadding, some or all of which may be impregnated with an insecticide (pyrethrum extract, DDT, etc.) and a thin cardboard or paper supporting sheet on at least one side of the wadding. The insects will pick up a lethal dose of insecticide before penetrating further into the package. 4 figures. R.C.R.

HIERSTEINER, WALTER. Container. U. S. patent 2,631,772. Filed April 6, 1949. Issued March 17, 1953. 1 claim. Assigned to Tension Envelope Corporation. [Cl. 229-68]

A paper boxlike container is formed like an envelope in flat condition with side and bottom flaps sealed together and with the closure flap open for insertion. After the contents (e.g., greeting cards) are inserted, the envelope expands to its boxlike form. 14 figures. R.C.R.

KOZAK, WALTER F. Color forming chemical reaction recorder. U. S. patent 2,631,918. Filed June 14, 1951. Issued March 17, 1953. 5 claims. Assigned to General Electric Company. [Cl. 346-111]

A recording apparatus utilizes white recording chart paper, impregnated or coated with wax and then sprayed with a solution of phenolphthalein, and a stylus of sodium lead or sodium amalgam. The contact of the alkaline sodium on the paper containing the acid-alkaline indicator leaves a red mark. 3 figures. R.C.R.

MADORE, ARTHUR H. Hair curling paper. U. S. patent 2,631,593. Filed Jan. 2, 1951. Issued March 17, 1953. 1 claim. [Cl. 132-36.2]

A hair-curling paper has a series of projections on one side which act as a comb and corresponding indentations on the other side which act as minute curling oil cups. Tiny air-circulation holes are also incorporated. 7 figures. R.C.R.

RUBINSTEIN, MATTHEW N., and CAPLIN, STUART. Ready wrapper. U. S. patent 2,628,764. Filed Sept. 23, 1946. Issued Feb. 17, 1953. 6 claims. Assigned to Auto-Wrap Corporation. [Cl. 229-53]

A normally collapsed, flat, bag-type paper wrapper for initially wrapping one or more prismatic-shaped objects comprises a tubular blank with a plait

folded therein. The tube is flattened while retaining the plait and the bottom end (containing the plait) is folded over and sealed to form the completed wrapper. 12 figures. R.C.R.

ST. JOHN, VINCENT J. Carbon paper holder. U. S. patent 2,629,612. Filed June 11, 1949. Issued Feb. 24, 1953. 2 claims. [Cl. 282-29]

A carbon-paper holder comprises a rectangular heavy paper or cardboard backing sheet (I) and a plurality of carbon paper sheets arranged in superposed registering relation on (I). The upper end portions of (I) have hinged tabs which detachably interlock in slits in the carbon paper permitting easy insertion and removal of the typing paper. 8 figures. R.C.R.

SCHWEIKERT, EDWARD W. Sanitary underwear liner. U. S. patent 2,629,380. Filed Oct. 31, 1950. Issued Feb. 24, 1953. 1 claim. [Cl. 128-284]

An attachable and removable disposable soft paper or tissue lining is designed for use on the inner surface and adjacent surounding area of the crotch of shorts or like articles of underwear. 6 figures. R.C.R.

SONNENBERG, RUDOLPH. Bottle closure. Canadian patent 490,664. Filed June 12, 1948. Issued Feb. 17, 1953. 2 claims. Assigned to Mid-West Bottle Cap Co.

This is the same as U. S. patent 2,607,504 (Aug. 19, 1952); *cf.* B.I.P.C. 23: 73. 8 figures. R.C.R.

WACHTER, AARON, and STILLMAN, NATHAN. Vapor-phase corrosion inhibitor. U. S. patent 2,629,649. Filed Oct. 31, 1949. Issued Feb. 24, 1953. 20 claims. Assigned to Shell Development Company. [Cl. 21-2.5]

Paper, cardboard, cloth, etc. are impregnated with compounds such as salts of nonaromatic amines with not more than 25 carbon atoms per molecule and carboxylic acids whose dissociation constants are 10^{-4} to 10^{-8} to provide corrosion-inhibiting wrapping materials for ferrous metals. Salts found suitable include cyclohexylammonium benzoate, laurate, oleate, and bis(cyclohexylammonium) phthalate. This is a continuation-in-part of the following patent. R.C.R.

WACHTER, AARON, and STILLMAN, NATHAN. Vapor phase inhibitors of corrosion. U. S. patent 2,630,368. Filed June 1, 1946. Issued March 3, 1953. 18 claims. Assigned to Shell Development Company. [Cl. 21-2.5]

Kraft paper impregnated with amounts of morpholine nitrite sufficient to produce a corrosion-inhibiting concentration of its vapors is wrapped around normally corrodible ferrous metal, and overwrapped with metal foil to prevent corrosion of the iron or steel object. R.C.R.

WHYTLAW, GRAEME G. Method for forming tubular articles. U. S. patent 2,631,509. Filed July 18, 1944. Issued March 17, 1953. 3 claims. Assigned to American Viscose Corporation. [Cl. 93-94]

A sheet of paper (or other flexible material) is provided with parallel rows of staggered slits and so guided that one lateral edge is lapped over

the opposite edge forming a hollow tube; a narrow strip of thermosensitive synthetic resin is introduced between the overlapped portions and then subjected to heat thus acting as cementing agent. The tubes are used primarily for wrapping wound packages of textile materials (rayon cakes, cones, etc.) preparatory to liquid treatment of such packages. 4 figures. L.E.W.

PLASTICS—PAPER-BASE

SWAIN, ROBERT C., and ADAMS, PIERREPONT. Benzyl cellulose coating compositions. Canadian patent 490,572. Filed May 22, 1941. Issued Feb. 17, 1953. 3 claims. Assigned to American Cyanamid Company.

Benzylcellulose (I) is blended with not more than an equal proportion of a melamine-formaldehyde resin (II) which is alkylated with an alcohol from the group consisting of propyl and octyl alcohols and having a molal ratio of formaldehyde to melamine of about 4:1. This produces a coating composition suitable for use in lacquers, paints and enamels. A clear, tough film is formed after application and heating. Equal parts of (I) and (II) (prepared from *n*-propanol) may be applied to paper or textiles and heated to 135°C. for three minutes to produce insulating materials. Other combinations of (I) and (II) may be used to impregnate paper to produce laminated materials of high strength and good electrical properties. Methods of preparation of the various forms of (II) are given. R.C.R.

SWAIN, ROBERT C., and ADAMS, PIERREPONT. Coating compositions containing benzyl cellulose. Canadian patent 490,571. Filed May 22, 1941. Issued Feb. 17, 1953. 4 claims. Assigned to American Cyanamid Company.

This is similar to Canadian patent 490,572 (*cf.* preceding abstract), except that the melamine-formaldehyde resin (I) is alkylated with an alcohol containing from four to six carbon atoms (butyl to hexyl alcohols). Additional methods of preparation of the various forms of (I) are given. R.C.R.

SHIPPING CONTAINERS

BELSINGER, JACK R. Shipping container for heavy bulk merchandise. Canadian patent 490,592. Filed April 20, 1951. Issued Feb. 17, 1953. 2 claims. Assigned to Belsinger, Inc.

A corrugated or fiberboard shipping container for nails, rivets, and the like comprises a bottom and top outer sections (I) and a liner section (II). (I) are of identical horizontal cross section and symmetrical with each other so that the top part can act as a lid and fit down over (II) which is secured to the lower outer section; the adjacent outer surfaces of (I) are thus flush. (II) reinforces the walls of the container. 7 figures. R.C.R.

CALCATERRA, JOHN. Boxes. Canadian patent 490,476. Filed June 19, 1950. Issued Feb. 10, 1953. 8 claims. Assigned to Shelton Manufacturing Company, Inc.

Strong rigid corrugated paperboard shipping boxes are constructed from a single blank and have side walls with integral lower extensions which fold inward and then upward to provide a two-layered bottom and two-layered end walls. 6 figures. R.C.R.

GIROUX, ALEXANDER L., and AQUINO, SALVATORE A. Multi-

compartment shipping cartons. Canadian patent 490,974. Filed Sept. 16, 1950. Issued March 3, 1953. 3 claims. Assigned to The Hinde & Dauch Paper Company.

A paperboard carton for shipping glassware has a collapsible rectangular body and a combined closure wall and partition structure at one or both ends. The partition structure is formed by extensions of portions of the closure wall which interlock in a crisscross system of upright partitions, acting to stiffen the end-wall structure and internally brace the whole carton. 16 figures. R.C.R.

SPALDING, RICHARD O. Carton. U. S. patent 2,628,762. Filed June 21, 1949. Issued Feb. 17, 1953. 1 claim. Assigned to Owens-Illinois Glass Company. [Cl. 229-15]

A corrugated rectangular paperboard carton for shipping glassware is provided with partition strips, including a strip extending the full length of the carton combined with and in interlocking relation to a strip which is bent back and forth to provide transverse cell walls. 3 figures. R.C.R.

WASYLUKA, PAUL. Carton. U. S. patent 2,630,962. Filed Oct. 15, 1949. Issued March 10, 1953. 7 claims. Assigned to Gaylord Container Corporation. [Cl. 229-31]

Hinged-cover paperboard cartons for shipping and/or storing vegetables, etc. are made from single blanks and require only one staple at each corner fold. The folded corner construction forms a supporting ledge for a marginal tuck flap of the closed cover. 19 figures. R.C.R.

SHIPPING CONTAINERS—FIBER DRUMS

ELMENDORF, ARMIN. Cylindrical container. U. S. patent 2,630,934. Filed July 31, 1948. Issued March 10, 1953. 9 claims. [Cl. 217-1]

The blank for a tubular container includes two layers of paper (e.g., kraft linerboard); between them a layer of wood veneer is secured separated along the grain into narrow, unconnected strips so spaced as to extend the length of the veneer (across the grain) by 5-15%. The inner layer of the paper is provided with creases located substantially along the gaps between the veneer strips. Flexible metal-sheet straps are attached to the outer blank for assembling the container. 8 figures. R.C.R.

SHIPPING CONTAINERS—FROZEN FOODS

FEIGENBAUM, DAVID L. Refrigerating shipping container for frozen foods. U. S. patent 2,631,439. Filed Jan. 28, 1950. Issued March 17, 1953. 5 claims. Assigned to Little America Frozen Foods, Inc. [Cl. 62-91.5]

A fiberboard or corrugated paperboard container for shipping frozen foods comprises upper and lower telescoping parts forming a complete enclosure. The centrally located, refrigerant-containing compartment is perforated to facilitate circulation. Standard newsprint may be used as insulation around the refrigerant (dry ice) and fiber-glass or rock-wool pads for the top and bottom of the container. 13 figures. R.C.R.

SULFUR

HERNDON, LYLE K. Sulfur recovery process. U. S. patent

2,631,087. Filed Aug. 2, 1950. Issued March 10, 1953. 3 claims. Assigned to The Fluor Corporation, Ltd. [Cl. 23-226]

A gaseous mixture (obtained by decomposing acid sludges with incandescent coke) comprising sulfur dioxide (4-50 mole per cent), sulfur-bearing gases (hydrogen sulfide, etc.), coke breeze, and oil vapors is scrubbed to remove all but the sulfur-containing compounds. A hydrocarbon-containing component is added, the mixture preheated and the sulfur dioxide reduced by bringing it into contact with incandescent coke at 1200-1600°F. The vapor mixture (hydrogen sulfide, sulfur dioxide, etc.) is then catalytically (aluminum oxide) converted to sulfur. 5 figures. R.C.R.

SULFUR DIOXIDE

DU BOIS, HORACE A. Process for cooling sulfur burner gas. U. S. patent 2,598,116. Filed May 7, 1948. Issued May 27, 1952. 5 claims. Assigned to Paper Patents Company. [Cl. 183-120] Canadian patent 490,819. Filed June 21, 1948. Issued Feb. 24, 1953. 5 claims. Assigned to Paper Patents Company.

The method of cooling hot sulfur dioxide-containing gases comprises the provision of a precooling column and a main countercurrent trickle cooling column with a side-branch, circulatory, heat-exchange cooling system. The side branch derives liquid from the bottom of the main column, conducts it through a heat exchanger and restores it, cooled, to an intermediate region in the main column, where cooling is effected by contact of the hot gases with films of the cool liquid trickling over inert material. A countercurrent tertiary cooling column (I) operates with fresh makeup water feeding the main trickle or second cooling column and is located above the portion of the main column containing the circulating liquid. The system can be modified by locating (I) in a separate tower or shell. River or pond water may be used. 2 figures. R.C.R.

TALL OIL

WAUGH, STANLEY P. Stabilized compositions containing sulfurized esters of tall oil. U. S. patent 2,631,131. Filed April 19, 1950. Issued March 10, 1953. 21 claims. Assigned to Tide Water Associated Oil Company. [Cl. 252-32.7]

A composition, adaptable for use as a cutting oil, comprises a mineral oil or sulfurized mineral oil, a sulfurized esterified tall oil (2-50% based on the weight of the composition) and an oil-soluble metal salt of an ester of thiophosphoric acid (0.1 to 10%). The metal salt is present to inhibit formation of metal-adhering deposits. The concentrate of the composition is also claimed, and the sodium salt of petroleum mahogany acids can be added as a solubilizing agent for the metal salts. R.C.R.

WAUGH, STANLEY P. Sulfurized tall oil-containing compositions. U. S. patent 2,631,129. Filed June 2, 1949. Issued March 10, 1953. 20 claims. Assigned to Tide Water Associated Oil Company. [Cl. 252-32.7]

This patent is similar to the previous one, except that the claims are limited to the use of the composition for preparing cutting oil. The oil-soluble metal salt can be of an alkyl cycloaliphatic dithiophosphate. R.C.R.

TEXTILE INDUSTRY AND FABRICS—TESTING

BROWN, HUGH M. Tensile strength tester. U. S. patent 2,629,254. Filed June 27, 1950. Issued Feb. 24, 1953. 15 claims. Assigned to Clemson Agricultural College of South Carolina. [Cl. 73-90]

The test specimen is secured between a pair of clamps carried respectively by a pendulum and a swingable support from which the pendulum is suspended; it thus supports a component of the weight of the pendulum and attached parts which varies between zero and a maximum, depending on the angular position of the swingable arm. Results are charted by a scribing instrument attached to the pendulum. The tester is designed for use in the textile industry. 5 figures. R.C.R.

WAXES

FERRIS, SEYMOUR W. Container having wax product coating. U. S. patent 2,624,501. Filed Nov. 25, 1950. Issued Jan. 6, 1953. 9 claims. Assigned to Sun Oil Company. [Cl. 229-3.1]

A hydrocarbon paraffin wax with high tensile strength, flexibility, and adherence to paper is prepared from petroleum slack wax by dissolving the wax distillate from vacuum distillation in a mixture of methyl ethyl ketone and benzene in about equal volumes at 165-195°F., cooling, filtering, and washing the filter cake in the same solvent as employed for dissolution. The wax has a melting point of 125-132°, a viscosity of 37-41 (Saybolt Universal at 210°), a penetration of 21 (77°), tensile strength of 275-325 p.s.i. at 40° and is distillable at 400-650° at 10 mm. mercury pressure. It is especially suitable for coating fibrous sheets and containers for packaging. R.C.R.

WET STRENGTH

NILES, GEORGE E. Thermosetting resins and process of preparing same. U. S. patent 2,632,700. Filed Oct. 29, 1949. Issued March 24, 1953. 20 claims. Assigned to Monsanto Chemical Company. [Cl. 92-21]

Nitrogen-containing thermosetting resins for incorporation in paper products in the beater to impart wet strength are prepared by reacting one molecular proportion of urea with two to three molecular proportions of formaldehyde in an alkaline aqueous solution at a pH of 7.2-8.5 at 50-70°C. to form a methylolated urea. To this solution is added 0.05-0.5 molecular proportion of a water-soluble salt of a hydroxy organic sulfonic acid (e.g., sodium salt of phenylisethionic acid) and the resulting solution is concentrated to a solids content of 55-65%; sulfuric acid is added to attain a pH of 4.5-5.5. The solution is then heated above 80°C. and below its boiling point until its viscosity at 60% by weight of resin solids is 5-10 poises (Gardner-Holdt bubble viscometer). A water-soluble base is added in an amount sufficient to minimize further increases in viscosity. A quantity of the 60% solution providing 1.5% resin solids (based on ovendry pulp solids) and 3% aluminum sulfate, added to refined bleached sulfite pulp increased the wet strength of handsheets from 1.75 to 3.67 p.s.i. Drying of the resin-containing stock or handsheets at 150-300°F. renders the resin insoluble and infusible. Various types of amino compounds and aldehydes suitable for use in preparation of the resin are listed. R.C.R.

Book Reviews

GORE, W. L. Statistical methods for chemical experimentation. New York, Interscience Publishers, 1952. 210 p.

A surprising amount of material has been compressed within the 210 pages of this 5 by 7-inch pocket book. A list of chapters will serve to highlight the scope of the work: introduction, statistical concepts, the reliability of estimates, analysis of variance, design of experiments, correlation and regression, and attribute statistics. Tables of normal distribution areas, student's t, chi-square, variance ratio, and correlation coefficient are appended. Forty-six formulas given in the text, together with a glossary, are brought together in the appendix. Brief comments on 14 books are included in the bibliography. A satisfactory rapport between the statistician and the chemist has been slow in developing, and the application of statistical methods in the chemical field has lagged behind that in many others. Even now, there are a scant half-dozen books with which the chemist may feel at home, and the present volume is a welcome addition to the list. The author has given sympathetic treatment to problem types of especial interest to the chemist, and has pointed out pitfalls commonly arising from the thoughtless application of formulas. Particularly satisfying is the consideration given to sampling, the control of bias, and cause-and-effect relationships. Many chemists have not had sufficient formal study in statistical methods to permit working in the field with a reasonable degree of self-assurance. Consequently, a wholly useful book must not be so forbidding as to discourage constant application, and at the same time the treatment must be sufficiently explicit and comprehensive to permit the fruitful application in the variety of problems likely to be encountered. In the present book, the treatment of each aspect has necessarily been brief and the reader may find situations, particularly in application of analysis of variance and of multiple regression, which require additional background material. In general, the presentation is clear and logical, and the application of formulas given in the text is amply illustrated. There is a hazard of quite a fundamental sort in presenting a practical manual of this kind, that applying formulas without full understanding of their import may lead to incorrect solutions or false conclusions. The author believes that a feeling for the philosophic logic and knowledge of practical limitations permits successful application of statistical techniques without understanding the origin or mathematical relationships of the formulas used. This viewpoint is not without justification, but it may be hoped that the brief introduction of this manual will inspire the experimenter to explore further the more esoteric aspects of the subject.

B. L. BROWNING

STAMM, ALFRED J., and HARRIS, ELWIN E. Chemical processing of wood. New York, Chemical Publishing Co., 1953. 595 p.

Although the objective of this work was to assemble all available information on methods for producing modified wood products, pulp products, and various derived chemical products, the authors have also included several fairly comprehensive chapters on wood components, wood structure, mechanical and thermal properties of wood, as well as its more important surface properties. These lead naturally into sections on air and kiln drying of timber, on preservatives and fire retardants, and subsequently to the main objectives of the monograph. These certainly include processes galore, not a few of which have emanated from the United States Forest Products Laboratory in which the two authors serve as research chemists and specialists. Of necessity the material is heterogeneous, dealing as it does with

modified woods, wood-base plastics and boards, pulp, paper, paper-base laminates, cellulose derivatives, wood distillation and hydrolysis, wood hydrogenation, and others. However, despite this heterogeneity and the rather brief handling of certain areas (like the chapters on pulping and cellulose derivatives), the book should prove very useful. The work even deals in a small way with tree exudates and extractives. The authors have compiled very well-balanced bibliographies, although very few of the references extend beyond 1949. The format of the book is good, the print is clear and the cuts (with the exception of a few unaligned structural formulas) are satisfactory. Other members of the staff at Madison helped in reviewing certain chapters, and their help has been very valuable. The authors have exercised critique in describing the various processes, pointing out their economic limitations and their favorable and unfavorable features. The book should prove of great value for chemists and engineers interested in wood processing and for students studying the minor forest products.

L. E. WISE

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